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In This Issue—*Making the Shop Pay*

AUG 26 1921

MOTOR AGE

Vol. XL
Number 8

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, AUGUST 25, 1921

Thirty-five Cents a Copy
Three Dollars a Year

What England's Experts Say About Essex

"Absolutely the Brightest, Liveliest Little Engine I Have Ever Found in an American Car."

S. F. Edge in "The Auto Car," London, Eng.

"Another of the five cars I used during the last few weeks was one I cannot help mentioning, the four-cylinder Essex, with an R. A. C. rating of 18.4 hp. It is an American production, with absolutely the brightest, liveliest little engine that I have ever found in an American car; in fact, this motor might really have had a Coatalen or a Pomeroy as its sponsor. Quite outside the engine's merits, however, the whole car is good, pleasant to use, and striking. The steering is light and easy; the springing is good; the brakes are good; in fact, everything to do with its driving is most satisfactory. The price charged, too, is very reasonable for what is given, by comparison with the prices of other cars.

The ability of the Essex to climb hills on top speed, and yet give you a comfortable 45 miles per hour with four people up, is unequaled in my experience of four-cylindered cars of the same engine dimensions."

"A Colossal Revelation of the Value Americans Can Offer at Its Price."

E. N. D. in the "Auto" of London, Eng.

"I have seldom felt widely enthusiastic about American cars, because those I have tested have so often been very nice cars which might have been much nicer cars if another £10 or £50 had been spent upon their production. But during a short holiday taken recently, I chanced upon the 18.4 hp. four-cylinder Essex, and to warn off at once those who do not like enthusiasm, I may say that, judged by the sample I borrowed for a day during August last, this Essex is a magnificent four-cylindered car, would be that at any price, and is a colossal revelation of the value Americans can offer at its price.

I am not going to say that the Essex is the best value existent, because there are many comparatively new cars most of us have yet to try. But I don't know anything like it. * * *

It looks to be so really and truly built, right through, that I am sure the stuff will be worthy of the design and the workmanship. Given that, it is today one of the most remarkable examples of value for money the whole world of car-producing countries can offer, in the London market."

"Its Transcontinental Record Is Not Merely a Record—it's a Miracle."

From "The Car," London, Eng.

"I refer to the remarkable achievement of a stock model Essex touring car in crossing the American continent from San Francisco to New York in 4 days, 14 hours and 43 minutes.

Not—I think—even the rigorous tests of Africa could inflict more punishment on an automobile than this non-stop run. There are runs through arid desert country with sagebrush; mountain climbs where the roads are just notches that God might have whittled, and drops of thousands of feet to stony valleys; dirt roads that a sudden shower converts into three feet of mud. I know these roads. I've broken springs and tires and commandments on them, and I know whereof I speak when I say that it's not merely a record—it's a miracle."

ESSEX MOTORS DETROIT USA

You Can Sell the Car of Which the Whole World Speaks So Enthusiastically

E S S E X

DETROIT, MICHIGAN

ESSEX MOTORS DETROIT USA

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169 Massachusetts Avenue	75 Fremont Street	27 Watson Street	1508 Candler Building	461 Eighth Avenue	1436 S. Michigan Avenue
PITTSBURGH	MONTREAL	PHILADELPHIA	CLEVELAND	KANSAS CITY	
303 Penn Avenue	392 St. James Street	318 N. Broad Street	6225 Carnegie Avenue	209 E. 18th Street	

MOTOR AGE

Published Every Thursday by

THE CLASS JOURNAL COMPANY

MALLERS BUILDING

59 East Madison Street, CHICAGO

HORACE M. SWETLAND, *Pres.* W. I. RALPH, *Vice-Pres.*
E. M. COREY, *Treas.* A. B. SWETLAND, *Gen. Mgr.*

Member Audit Bureau of Circulations; Member Assoc. Business Papers, Inc.

Vol. XL AUGUST 25, 1921 No. 8

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MOTOR AGE

MALLERS BUILDING
CHICAGO

Phone Randolph 6960
Cable Address "Motage"

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SUBSCRIPTION RATES

United States, Mexico and U. S. Possessions	$ 3.00 per year
Canada	5.00 per year
All Other Countries in Postal Union	6.00 per year
Single Copies	35 cents

Make Checks Payable to Motor Age

Entered as second-class matter, September 19, 1899, at the Post Office, Chicago, Illinois, under Act of March 3, 1879.

Owned by UNITED PUBLISHERS CORPORATION, 239 W. 39th St., New York, H. M. Swetland, Pres.; Charles S. Phillips, Vice-Pres.; A. C. Pearson, Treas.; Fritz J. Frank, Sec.

We have built up a strong retail demand for Van Kerr Transformers

Extensive advertising direct to the car owner has told millions of automobilists about the Van Kerr Transformer; and will tell millions more. In strong forceful language in magazines, newspapers and on billboards we have told the car owner how the Van Kerr Transformer gives him greater power, reduces gasoline consumption, prevents formation of carbon.

The result is that already we have over 100,000 satisfied users. That means that our advertising is getting the story over and making customers.

We will continue to back up our dealers with result-getting advertising. We have created a big demand. We are going to make that demand bigger. And we offer dealers big profits in helping us supply it.

Sale Guaranteed

We can guarantee sales because we know how good the Van Kerr Transformer is and what a big and growing demand there is for it.

It sells for $2.00 for a four-cylinder set, $2.50 for a six-cylinder set.

This is your chance for big profits. Write for our proposition today.

The Van Kerr Co.

3160 N. Clark St., Chicago

Sell MORE Cars With This Irresistible Appeal!

Velie Quality at Low Price!

Motorists everywhere, when they think of the Velie think of QUALITY. Velie Reputation, Appearance and Performance have universally established the Velie on a plane above the ordinary. You know this to be true.

Now—with the Velie's cut of $400 on the larger six and $200 on the smaller six—you go to a far bigger market than ever. *You reach all the prospects who are not satisfied with the usual run of automobiles. You have the Quality SIX—at the price they will gladly pay.* You reach an unlimited field of buyers who have heretofore had to be content with a four. Velie at its new prices is the bargain of the year in motordom. Model 48 is absolutely *the lowest priced SIX* with Continental 7-R Motor and Timken Axles.

Such an opportunity was never presented to dealers before. You offer the car that is constantly advertised by amazing performance—now by its victory in an economy run—now as leader in a mountain climb—now as prize winner in style shows. On its unparalleled feat of conquering the Grand Canyon Velie Six Model 34 demonstrated power and stamina that have aroused every motor mart. And you have the testimony of owners of mileage and low upkeep seldom equalled, and not beaten.

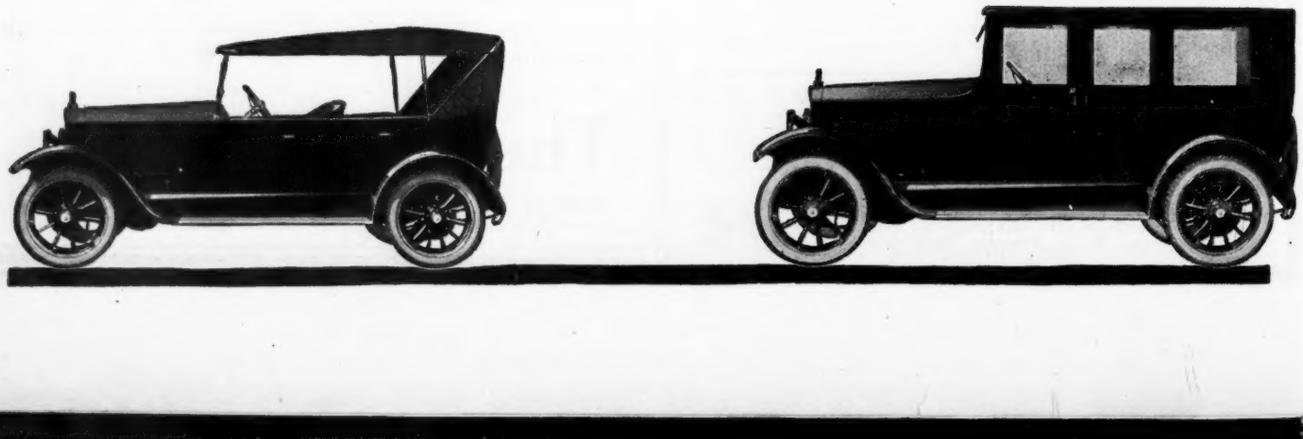
Apart from the sales advantage in superior values of lower price the Velie is backed by an organization second to none in experience and stability, and by liberal co-operation with our dealers and owners alike.

Eight models open and closed give you a car for every demand. If your territory is not closed we suggest you get in touch with us at once

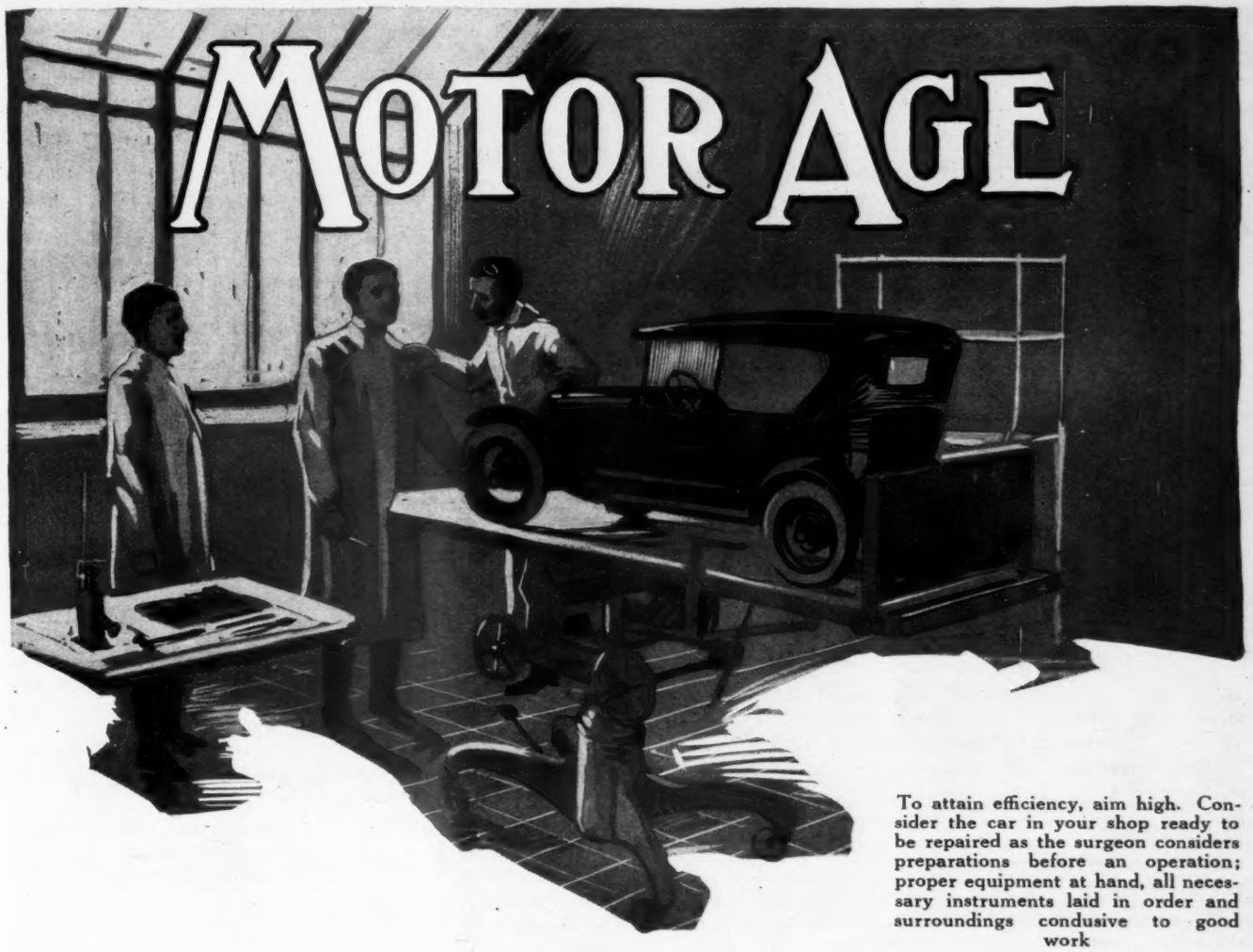
VELIE PRICES

Model	Cut	Present Price
48 Touring	$400	$1585
48 Sedan	400	2485
48 Speedster	400	1800
48 7-passenger	300	1950
34 Touring	200	1385
34 Roadster	200	1385
34 Sedan	400	2085

Velie Motors Corporation, 113 Velie Place, Moline, Ill.



VOL. XL., No. 8 CHICAGO, AUGUST 25, 1921 $3.00 Per Year



To attain efficiency, aim high. Consider the car in your shop ready to be repaired as the surgeon considers preparations before an operation; proper equipment at hand, all necessary instruments laid in order and surroundings condusive to good work

Making the Shop Pay

Check Your Methods Against the Time and Labor-Saving Ideas Presented in This Article— It May Disclose a Leak That Is Wasting Money

THREE factors are important in making the automotive repairshop pay a profit—the mechanic, proper diagnosis of the job and the facilities for doing the work correctly and quickly.

There are others, of course, and included in the list would be such items as good arrangement of tools, the avoidance of unnecessary steps between the bench and car, plenty of room, good light, etc.

THE mechanic is important because he is the intermediary between the dealer, or the man operating a service station, and the customer. He must, of necessity, be largely responsible for the kind of job turned out. While he may be under the observation of a foreman or master mechanic, he cannot be watched all the time, and much of his work will never be checked by anyone other than himself.

Good mechanics, the service managers will tell you, are scarce. There are plenty to be had who are able to perform the more simple operations in connection with the servicing of cars or trucks, but the men hard to get are those who possess a certain amount of theoretical knowledge to supplement their mechanical ability. Still, it is not uncommon to find these days plenty of good mechanics who understand such terms as "volumetric efficiency," "mean effective pressure," "venturi," etc.

But why should a mechanic bother himself about things which, after all, seem remote from his daily tasks of grinding valves, adjusting bearings or tuning carbureters? Simply for this reason: the more knowledge a mechanic can acquire along engineering lines, the better able he will be to do his work. For example, a man makes a certain

JOB: INSTALL CAMSHAFT GEAR

TIME ALLOWED: 1 hr. 20 min.

TOOLS

106 - Camshaft Gear Puller
80 - Socket Wrench
47 - Double End Wrench
82 - Fan Pulley Puller
16 - Hammers
24 - Pliers
77 - Cotter Pin Puller

MATERIALS

1057 - Camshaft Gear
368 - Cotter Pin

It would help if every mechanic, or the shop at least, had a book in which was listed the service operations on a car, stating besides the time necessary to do the job the tools and materials needed. It would save time in the shop and eventually mean more profits

adjustment on a carbureter, and he knows that turning the adjusting screw one way enriches the mixture, while turning it the other way thins out the mixture. But, simple as this job may seem, he cannot do it right unless he knows why he is doing these things and is ruled by the fundamentals governing gas mixtures.

The mechanic should know, for instance, the relation of temperature to carburetion. Frequently carbureter adjustments are employed to correct a poorly-running engine when, in fact, the trouble lies with the engine's running too cool even after it is "warmed up."

Many similar cases could be cited. The factory which builds a car generally has spent thousands of dollars on the design; it has employed experienced engineers who have built certain things into the car that it might function correctly. Does it not, therefore, seem logical that the mechanic who works on that car should have at least enough engineering knowledge to diagnose intelligently the trouble and to correct it in such a manner that the car will again function as the factory engineers intended it should?

It is a case of carrying on. The engineers say the engine should operate with the cooling water at a temperature of 180 deg. to develop its maximum efficiency; and the car leaves the factory that way. Then, if the car owner is to get satisfactory service from that car he must be assured that all parts are functioning correctly. That is where the service man comes in—not only the head tester, but the mechanic who fits the new pistons and rings or installs the new carbureter which the customer has ordered.

Thus, the more a mechanic knows about the fundamentals regarding the design and operation of motor vehicles, the better are his chances for doing a repair job correctly the first time.

The mechanic, then, is one of the big factors in helping to make the shop pay.

Proper Diagnosis of Trouble

In improper diagnosis of trouble is, perhaps, one of the biggest single sources of dissatisfaction on the part of customers with the field of service today. "Shooting trouble" is a hard job. It becomes easier, of course, when a crew of men has to work on one make of car alone, as they soon discover the characteristics of the car.

For example, a car of well-known make was taken to several service stations because of a peculiar knock which seemed to come from the front end of the engine. It was variously laid to timing gears, camshaft bearings, pistons, etc. The owner of the car finally took it to a man who had worked on this make of car for a long time. He listened to the engine for a few minutes and stated No. 1 connecting rod was out of alignment and that perhaps one or two of the others were not running quite true. He was correct in his diagnosis, because experience had taught him the characteristics of the engine.

A good "trouble shooter" can almost instantly distinguish carbureter trouble from ignition trouble—a thing which puzzles many. Thus, a car owner comes in with what he claims to be faulty carburetion and is quite surprised to hear the service man state his trouble is ignition.

Faulty diagnosis of trouble has been responsible for much dissatisfaction in the past, both on the part of the customer and the service station. A good "trouble shooter" soon establishes the reputation for a shop, and is, or should be, one of the most valuable men. Many mechanics can remedy trouble after they know where the fault lies, but everyone cannot be a good diagnostician of mechanical troubles encountered in operation of motor vehicles.

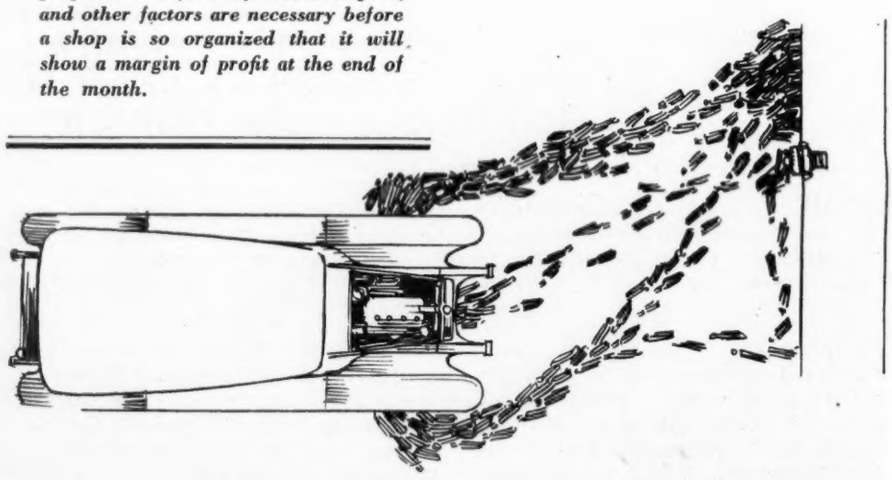
Correct diagnosis of the job makes it easier for the shop to turn out the work, because the men have something definite on which to work. This, like the mechanic, is another contributing factor towards making the shop pay.

ONE of the important things with a great many shops in the country is organizing the service and repair work in such a way that the shop pays a profit. Many a shop which now complains of being too busy probably could take on additional work, were it organized correctly. It is not enough to have men, machinery, tools and a good-sized stockroom. Correct diagnosis of troubles, avoidance of overlapping of the efforts of mechanics, good tool layouts, proper preparation before a job is attempted, and other factors are necessary before a shop is so organized that it will show a margin of profit at the end of the month.

Tool Arrangement

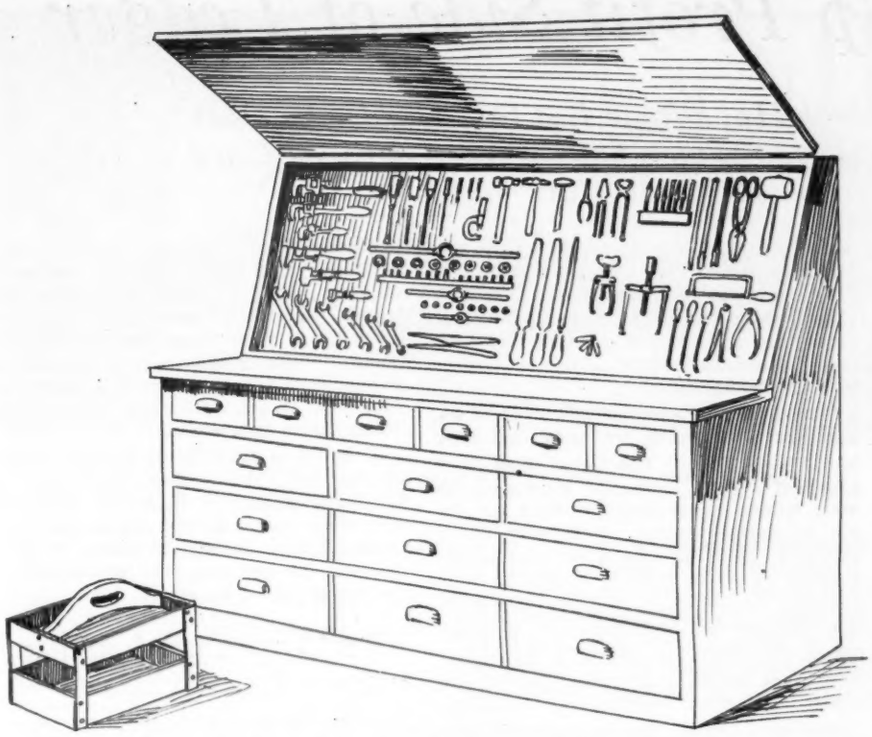
"A place for everything and everything in its place" is an old adage, but it applies well to the automotive shop. One has only to go into the average shop and observe the men working to see that their work is not always organized to the best advantage.

A man will get under a car only to find he has forgotten to provide a gear puller,



A good many mechanics in the service branch of the automotive industry are paid for walking instead of working. By having properly diagnosed the job, picked the necessary tools and material, the number of foot steps—unproductive labor—would be materially reduced

An Efficient and Easily Checked Tool Arrangement



Keeping the shop tools in the proper kind of receptacle makes them easier to get at and prevents loss. In some service stations where a layout like this is used the space occupied by any tool is given a number and the tool is referred to by that number. When it is being used its absence is immediately noticed.

Tool and parts carriers are handy for the mechanic to carry about with him

socket wrench or some other tool. It means he must get out from under the car, walk to the bench or tool room, come back to the car and get under once more. Perhaps he finds he again needs some tool and the process of going back and forth to the bench is repeated. In other words, this man has not properly systematized his work for doing the particular job in question. He makes many false moves. The service station is paying him largely for walking and not for working.

If his work is organized he will proceed in something like the following manner:

He will know first what the job is; let us say it is that of replacing a camshaft gear. He might have a book, his own property, or belonging to the shop, in which is listed the particular operation. Under the heading "Install Camshaft Gear," he finds the time needed is 1 hr. 20 min. He also finds under "Tools" exactly what equipment is necessary on that particular make of car. Similarly under "Materials" he finds he needs a new camshaft gear and a cotter pin. He gets the tool equipment and materials together and when once he gets to the car to be repaired, has little need for leaving it until the job is finished.

There are times, of course, when a man runs into something unexpected after he gets a job torn down, and obviously this calls for a different procedure.

The big point is that the more completely a man can be prepared for a job, the sooner that job will be turned out and the more likely the shop will be to pay a profit. Some suggestions for arranging the shop tools, the listing of tools needed, etc., are given herewith.

Preparation of the Job

Motor vehicles operating over almost every kind of road condition naturally become covered with mud and dirt. And, the first thing to be done on a car brought in for repairs is to give it a cleaning. No good mechanic will attempt to dismantle a steering knuckle, for example, that is covered with hardened mud. He will not try to turn off a nut over threads that are filled up. The cleaning of parts is very essential and the work is of such a nature that it can be performed by cheap labor.

Another idea regarding the preparation of the job which is worthy of consideration by every service station is the use of protectors for the fenders, doors and other parts of the body. This prevents marring the highly finished surfaces, and when the job is finished, it is not necessary to spend time cleaning the car of grease or dirt brought about by the repair work. A clean car makes a good impression on the car owner, too, because he sees that the shop realizes his car is a high-priced article and must be treated as such.

Fundamentals

No matter how well your "trouble-shooter" has analyzed the job in question, or how well the mechanic has done the work, all will be lost if in the end the customer becomes aroused by putting his hand in a gob of grease on the steering wheel when he proceeds to drive the car out of the service station. It is highly essential that the car be in such shape that it can be turned over to the owner to his entire satisfaction.

Likewise, it is essential that the owner be properly received when he comes in. He should, insofar as possible, be hailed the instant he arrives and not be allowed to wander aimlessly about the place in search of some one to whom he can tell his troubles.

There must be some enthusiasm shown. The owner must be made to feel that his work is wanted and not only that it is wanted, but that it will be taken care of properly. A record of the proceedings always should be made. After the owner has stated his wants, it should not be sufficient for the service station employee to say, "All right, we'll take care of it." The chances are ten to one some of the items will be forgotten. He should fill out a card of some kind for a record, and, preferably, the owner should have a copy of this card.

The fundamentals of running any well-conducted business apply to the automobile service station and garage as well as they do to the dry goods store or any other line of business. A well-organized shop, and understanding on the part of the shop personnel of customers' wants, will help pay a profit.

In order to do a good job of repairing the mechanic must be able to get at the job well. And, one of the first things to do is to get the parts clean. Imagine a mechanic trying to disassamble a steering knuckle covered with mud!

Building Up Profit Side of Ledger

Some Ideas Which Have Been Put Into Use by Various Dealers to Increase Service Sales—An Appraisal Card for Used Cars

A PLAN that provides a dealer with an accurate record of all stock on hand, and at the same time provides a list of prospective customers for the same or other articles is in use by A. E. Davis, of Binghamton, N. Y., a dealer in farm equipment and supplies.

The plan involves the keeping of a stock record book, in which a sheet is allowed for each item handled. On this page is reproduced one of the records. It will be noted that this is a stock sheet for Hercules engines to be operated by gasoline, and columns are provided for listing the number on hand and the number of sales made for the following sizes: 1½, 3, 5, 7, 9 and 12 hp.

As will be seen from the record, on Jan. 1, 1921, there were 42 engines on hand, 38 of which were 1½ hp. and four 3 hp. On the 8th of January, two 5-hp. engines were received; on the 11th, three 3-hp., and two 5-hp. were added to the stock; on the 13th, three more of the 3-hp. and one of the 5-hp. were received. On the 2d of February, Davis received ten 3-hp. and seven 5-hp.; on the 3d of February there was a shipment of ten 1½-hp., five 3-hp., seven 5-hp., one 7-hp.

Now, what became of all these? At the bottom of the sheet will be seen a list of names of customers, together with their addresses, and in the proper column there is indicated the size of the engine purchased. At the time this sheet was filled seven 1½-hp. engines had been sold, eight 3-hp. and six 5-hp. The other sales are recorded on another sheet, not reproduced on this page.

The advantage of keeping stock in this way will be readily understood. At any time the sales can be totaled and subtracted from the figures indicating the receipts. This gives the number on hand. By watching these stock record sheets, Mr. Davis can forecast his needs accurately. Before his supply runs too low on any article he can place another order. For example, when a salesman comes from any particular manufacturer, Davis does not need to leave his desk to find out what articles he needs. He simply refers to his stock record book, and can tell the salesman exactly what he will need and when he will need it.

In determining the needs for the coming year, Davis bases his judgment on the past season's sales, and inasmuch as sales are recorded by items, it is no trick at all to forecast his needs. Of course, business conditions must be taken into consideration, and when there is a falling off in buying, Davis buys a little less than the sales figures might indicate. When business is picking up, he buys a little more liberally.

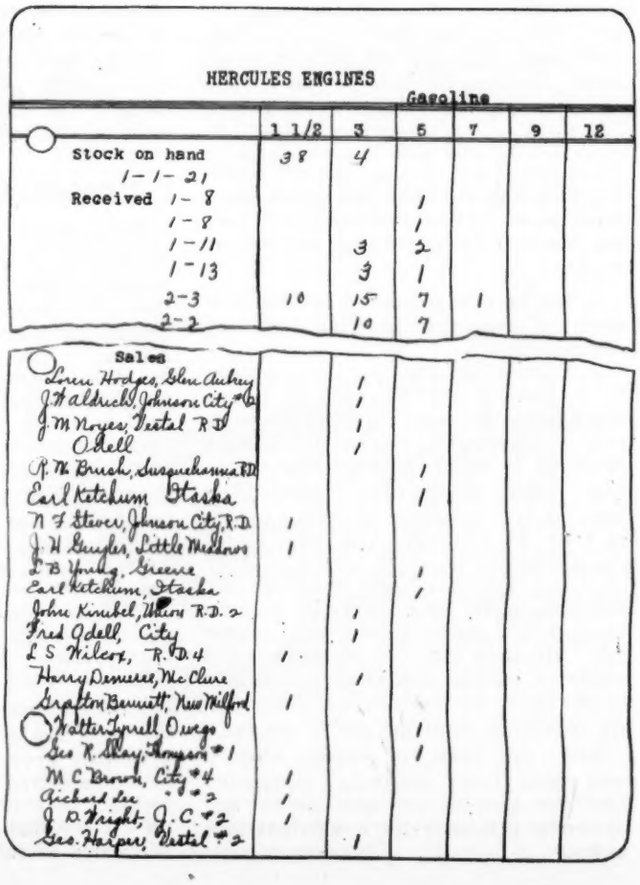
This plan has been used for some time, and has now proved its value, not only as a stock record sheet, but also as a prospect list. Take, for example, the man whose name appears first on the list of engine buyers. Next year Davis refers to this list and finds that Loren Hodges of Glen Aubrey bought a 3-hp. gasoline engine early in 1921. Knowing that Hodges has this power, it is quite logical for Davis to suggest some equipment that needs about that amount of power—a milking machine, for example.

The use of these lists as prospect lists might better be illustrated by referring to some other stock record. For example, the record of binder twine sales will show about how much binder twine is likely to be needed by the customers of Mr. Davis. Seeing from his record that R. W. Brush of Susquehanna used 300 lbs. last year, Davis naturally concludes that he ought to stock enough so that Brush can get at least that much this year. But more than that, having this record, Davis is prepared to write Brush the kind of a letter that will make certain that Brush will place his order at Davis' store this season.

It is not at all difficult to keep records of this sort. Many dealers already are following a plan of making a sales slip for every sale. If the dealer has these sales slips, it is only a matter of a little time to transfer the information to the stock record sheets.

An Appraisal Card for Used Cars

After having two or three costly experiences the past few months in appraising used cars and deciding the amount to allow for them on a trade-in for a new car, B. V. Stodghill, assistant sales manager of the John Smith Co., of Atlanta, retail Buick dealer, has originated an ap-

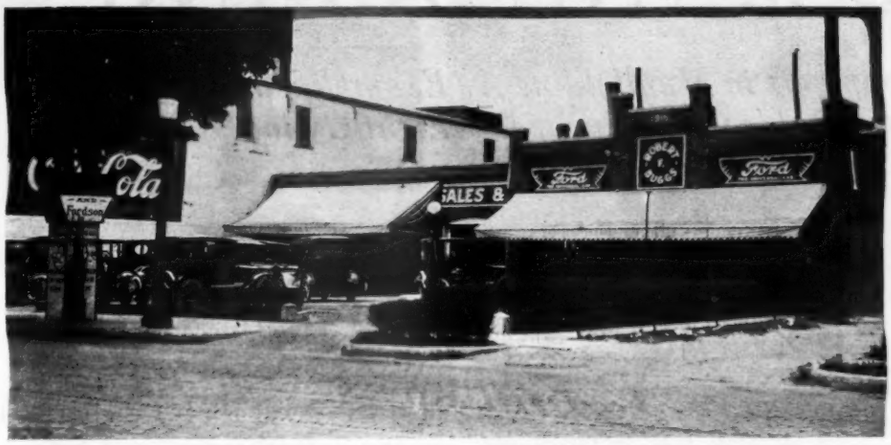


HERCULES ENGINES — Gasoline

	1 1/2	3	5	7	9	12
Stock on hand 1-1-21	38	4				
Received 1-8			1			
1-8			1			
1-11		3	2			
1-13		3	1			
2-3	10	15	7	1		
2-2		10	7			
Sales						
Loren Hodges, Glen Aubrey		1				
J. H. Aldrich, Johnson City #6		1				
J. M. Noyes, Vestal R.D.		1				
Odell		1				
R. W. Brush, Susquehanna R.D.			1			
Earl Ketchum, Otaska			1			
N. F. Stover, Johnson City, R.D.	1					
J. H. Gaugler, Little Meadows	1					
L. B. Young, Greene			1			
Earl Ketchum, Otaska			1			
John Kimbel, Union R.D. 2		1				
Fred Odell, City		1				
L. S. Wilcox, R.D. 4	1					
Harry Dennison, McClure		1				
Grafton Bennett, New Milford	1					
Walter Tyrell, Owego			1			
Geo. K. Sharp, Apalachin #1			1			
M. C. Brown, City #4	1					
Richard Lee, City #2	1					
J. D. Wright, J. C. #2	1					
Geo. Harper, Vestal #2		1				

A stock record which provides future prospects. At any time the sales can be totaled and subtracted from the figures indicating the receipts. By keeping these stock records on hand the dealer can forecast his needs accurately; before the supply runs low he can place another order

Making Use of the "Front Yard" for Service



One dealer has increased his service business by establishing this outside service floor. The large awning makes it possible to do work even in inclement weather

praisal card idea that will hereafter serve as ample protection to the company when allowances are made for used cars. The idea is one well worthy of emulation.

The card properly filled out appraises the car accurately and carefully from axle to hood and from radiator to taillight. All extra equipment is set down on the card, condition of the tires, battery, paint, motor, curtains, etc. At the bottom of the card space is provided for entering the price offered to the customer for the used car.

Many times the owner will not accept the price offered by the dealer at the time the first appraisal is made, but two or three weeks later he may decide to change his mind and advise the dealer to that effect. All the dealer needs to do then, if he has previously made out an appraisal card, is look over the car to see if it is in the same condition as when the appraisal was first made.

If there happens to have been a blowout in the meantime, or something of that nature, it would naturally be necessary to lower the original offer. If the dealer depends on his memory, as is most often the case, he is apt to lose money on the transaction. However, with an appraisal card that had been completely filled out when the car was originally examined, there is little chance to go wrong.

Outside Service Floor Increases Capacity

It is not uncommon for a service station to use space in the rear of the building for work; but it is not quite so common to find a service floor located in front of the service station.

The photograph which is reproduced on this page shows how Robert F. Buggs, a dealer in Ford cars and Fordson tractors, Janesville, Wis., has made use of his "front yard." There is room for about 15 cars in this work space, which has a concrete floor, and besides the advantage gained by the additional space there is the big advantage in its location in front of the service building. This makes it a sort of living advertisement for the service end of the business.

The garage is near the center of town, hence many people pass by. These passersby see not only the quantity of work that is being taken care of promptly, but they also get some idea as to the quality of it.

By carefully picking the men who work in this open space, Mr. Buggs has been able to create a splendid impression in the community. Of course, it would not be wise to place a careless workman, or one who is unattractive in his personal appearance out for public inspection in this space.

APPRAISAL CARD.

Date.....

Owner..... Address.....
Salesman..... Appraiser.....
Car..... Serial or Motor No.....
Extra Equipment.....

CONDITION OF CAR.

Tires—L. F.
" —R. F.
" L. R.
" R. R.
Spare Tire
Battery
Paint
Motor
Clutch
Transmission
Rear Axle
Top
Curtains
Tools
Running Boards
Carpets
W. Shield
Hood
Side Splash Aprons
Front Splash Aprons
Grease Pan
Generator
Speedometer
Horn
H. Lamps
Tail Lamps
Radiator
Hub Caps
Wheels
Rims
Crank Cover
Body
King Pins and Bushings
F. Wheel Bearings
R. Wheel Bearings
Gas Tank
Top Hangers
Floor Boards
Tire Rack
Muffler
Valves
F. Axle
R. Axle
Remarks:

Car Interested in
Price offered
Will Take Price $.....

It is quite a job to appraise a used car, but a card like the one above, properly filled out, is a great help

Another good purpose that this space serves is as a storage space for new cars. As new cars are brought in, they are assembled here. At the time the photograph was made, several new sedans were being prepared for delivery. Each car that was sold bore a big sign marked "sold," and, of course, this was good advertising.

Notice the big awning over the service part of the building, which makes it possible to do outside work, even during a rainstorm. The car that is being worked on is simply run under the awning. The building at the right is the office and the storeroom, and the building at the left is the service part of the building.

In addition to this outside space, Mr. Buggs has ample space inside the building for repairs that require the use of overhead tackle and stationary equipment. Most of the work that is done in the outside space is minor repairing and the making of adjustments.

Big Arrow Keeps Place Before People

While the large automobile agency building of Harold L. Arnold, South Figueroa street, Los Angeles, was being constructed he had to do business under the handicap of a small stand in the center of the block. It was not easily seen and the necessary scaffolding and piles of building materials were in the way.

To keep his place in the minds of the people during the period of construction he resorted to a novel plan. He had an arrow about 200 ft. long built as a protection fence along the site. The arrow was painted a light blue and his signature—the same that appears at the bottoms of his advertisements—was lettered on the shaft of the arrow in orange paint. On the tip of the arrow was the street number of his temporary stand, to which the arrow pointed. The butt of the arrow bore the words, "TEMPORARY SALESROOM." Eyes could not help but follow that arrow and as they did they saw a front painted in similar colors with the figures "927"—his street number—painted large.

INTAKE MANIFOLDING

Latest Developments in Manifolding As Exemplified by Induction Systems Used on European Eight-Cylinder Engines

EIGHT-CYLINDER engines have given a much-needed impetus to carbureter designing. So far the single carbureter has the preference of American designers while the dual or double types, each serving an independent induction system, stand high in the favor of the foreign engineers. There is also a strong tendency toward the adoption of two distinct carbureters. An example of the first mentioned installation is shown in Fig. 1 and of the last, as applied to a six-cylinder engine, in Fig. 2. Fig. 3 shows the conventional manifold and single carbureter as used on the leading American cars. For the reason that the aim of American designers is the simplification of apparatus to as great an extent as is compatible with satisfactory performance, the last shown installation has found favor in this country.

The principal factor in favor of the dual, double or twin carbureters is that, in the opinion of the foreign engineers, the independent induction systems effect a better distribution of the gas because there is no change in the direction of the flow at the main branch immediately above the carbureter. Offsetting this is the complicating duplication of moving parts and points of adjustment.

Though V type engines have come into use so recently that they and their carbureters perform satisfactorily on the present grades of fuel, a further deterioration in quality will present increasingly difficult problems to those who are called upon to service them as they age. Therefore, a close following-up of what is being done, both at home and abroad, along the line of carbureter and manifold design, is certain to prove of value at no very distant future date.

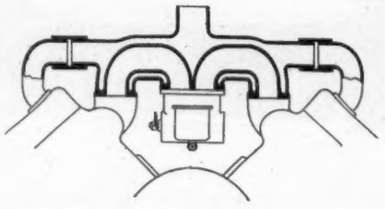


Fig. 1—Dual type carbureter supplying two independent intake manifolds

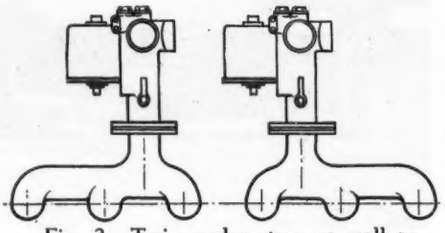


Fig. 2—Twin carbureters as well as the dual types are favored in Europe

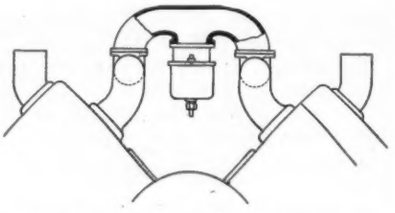


Fig. 3—Standard American practice. One carbureter supplies all cylinders

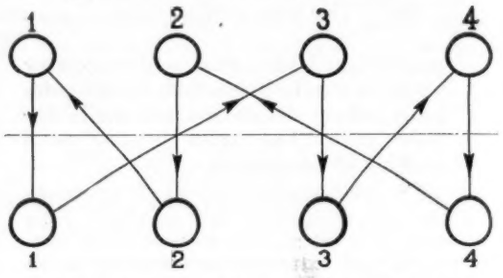


Fig. 4—One firing order used on eight-cylinder V type engines abroad

As in the four and six-cylinder engines, the manner in which the gas had best be distributed depends upon the firing order. Several orders are used, that shown in Fig. 4—1R-1L-3R-3L-4R-4L-2R-2L—being given preference by overseas designers. When analyzed this becomes the order of 1-3-4-2 for each group. Two examples of firing orders adopted by American manufacturers are 1L-2R-3L-1R-4L-3R-2L-4R and 1L-4R-2L-3R-3L-2R-4L-1R. In these also the order of each group is 1-3-4-2.

Despite the fact that the location of V type engine manifolds—between the cylinder blocks—affords some protection from chilling blasts, it has been found good practice to water-jacket them.

Eight-cylinder in-line engines operate very much like two independent four-cylinder engines. The mechanical details of their construction are comparatively simple, as they are made like two four-cylinder engines with their crankshafts coupled together at an angular difference of 90 deg. In fact, the earliest engines of this type consisted of two four-cylinder engines so coupled.

Generally, the manifolds of each group of four-cylinders are laid out as for a four-cylinder engine, and two independent carbureters are used. One European designer goes so far as to install three carbureters; two being used for high power and speed, and the third, a small one, for slow speeds or, as it has been called, "the loafing range." Fig. 5 shows

Analysis Showing Effect on Gasoline and Oil With and Without Hot Spot

GASOLINE

Gravity	*56.4*
Color	*Plus 23*
Doctor, with sulphur	*N. G.*
Odor	*N. G.*
Heat	*31 deg.*
Initial	*108*
At 221 deg	*24.0*
At 284 deg	*50.0*
At 374 deg	*85.0*
End	*430*
Loss	*2.0 Pct.*

LUBRICATING OIL
Without Hot Spot

Gravity	*30.3*
Flash	*265*
Fire	*465*
Pour	*40*
Color	*Cloudy*

With Hot Spot

Gravity	*30.1*
Flash	*330*
Fire	*460*
Pour	*45*
Color	*Cloudy*

Viscosity—Without Hot Spot

At 100 F	*217*
At 130 F	*116*
At 210 F	*49*
Conradson, carbon test	*.29 Pct.*
Acid value	*28*
Ash	*Trace*
Sed. by wgt	*Trace*
Sed. by vol	*Trace*
Dilution, at 600 deg. F	*5 Pct.*

Viscosity—With Hot Spot

At 100 F	*256*
At 130 F	*131*
At 210 F	*51*
Conradson, carbon test	*.22 Pct.*
Acid value	*18*
Ash	*Trace*
Sed. by wgt	*Trace*
Dilution at 600 F	*4 Pct.*

The analysis of the gasoline shows it to be a fairly representative sample of the fuel now being marketed. In other words, there is nothing in the analysis of this gasoline which would indicate that exceptional effects on the engine oil could be attributed to the amount of dilution. This important part of the analysis shows that with the hot spot the dilution is four-fifths what it is without the hot spot. Due to the fact that the car was standing still with the engine idling at 500 r.p.m. for two hours, the effects are not as pronounced as they would be under average conditions. Still there is a difference of 20 per cent noticed.

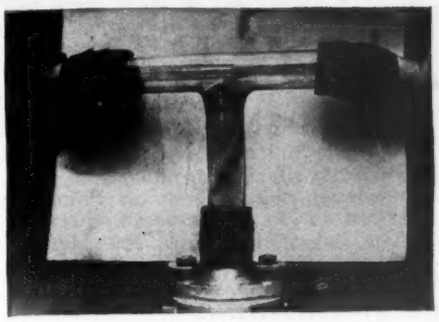


Fig. 6—At an engine speed of 450 the colored gasoline began to condense

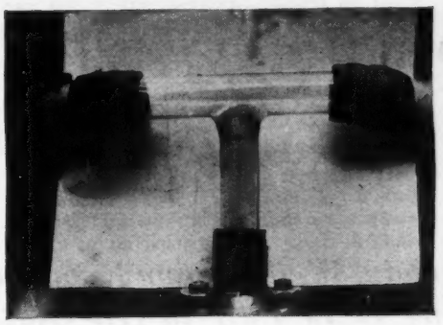


Fig. 7—At 850 r.p.m. the condensation was heavier. Note the vortex effect

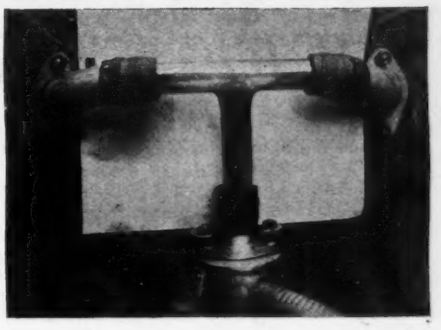


Fig. 8—With the throttle wide open the mixture looked like a solid mass

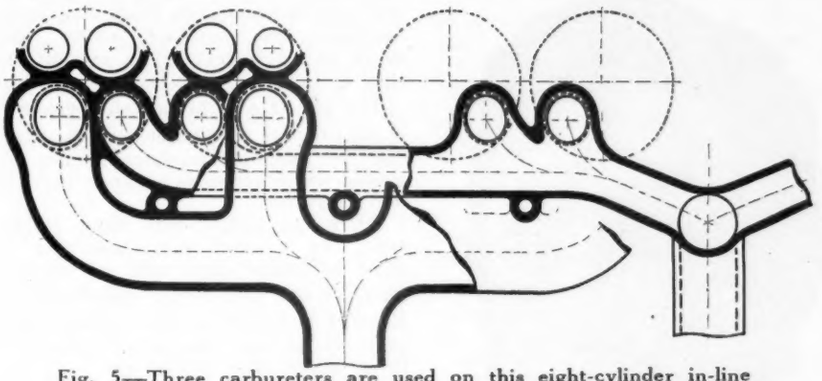


Fig. 5—Three carbureters are used on this eight-cylinder in-line engine. Two supply independent groups, as in Fig. 4, and a third small one supplies all eight at low and idling speeds

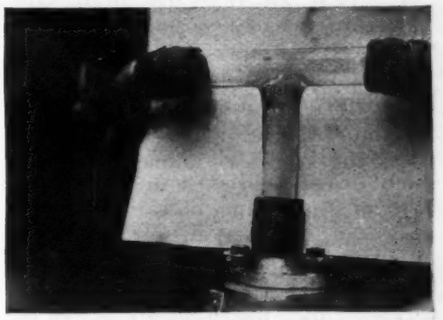


Fig. 9—Taken 36 seconds after the exhaust was admitted to the "hot spot"

half the layout. What appears to be the exhaust is really the main intake manifold. It supplies the large inlet valves. The smaller one is the auxiliary manifold, which supplies the small inlet velves. The main systems are independent, serving groups of four, while the supplementary serves all eight through one transverse branch. The cylinder dimensions are approximately 3½ in. bore by 5½ in. stroke. The main carbureters are, approximately, 1¾ in. and the auxiliary, approximately 1½ in.

GLASS MANIFOLDS EXPERIMENTS

Many experiments with glass manifolds have shown just how extensive condensation is. During 1920 MOTOR AGE conducted a number of experimental runs with the manifold and "hot spot" device illustrated in Figs. 6, 7, 8 and 9. Though the heating element was not located in the best position, the results were truly remarkable. A six-cylinder engine of a well-known make, capable of a wide speed range, was used. The conditions within the manifold at a speed of 450 r.p.m., "hot spot" inoperative, are shown in Fig. 6. The gasoline, colored so as to be easily photographed, was seen to collect in streams and globules all over the whole interior of the vertical column and the transverse branches.

Fig. 7 shows what happened when the engine speed was considerably increased. The "hot spot" was still inoperative insofar as its function as a preheating element is considered. However, its interior contour gave the rushing vapor a twist, causing the peculiar vortex effect shown. The condition of the still unheated mixture during a momentary full opening of the throttle is depicted in Fig. 8.

After the foregoing data was obtained as a basis of comparison, heat was admitted to the hot spot and within 36 seconds the interior of the pipes presented the appearance shown in Fig. 9. The mixture was practically perfect and passed as an invisible, dry gas.

The glass manifold demonstrates conclusively that it is not enough merely to apply heat in a haphazard manner. Although the illustrations are not clear enough to show it, there was considerable variation in the degree of condensation at various points. It was particularly noticeable at the bends and even varied from point to point over their short lengths.

The internal manifold and horizontal carbureter mounting were examined by means of the apparatus shown in Fig. 10. While, as expected, the condensation effects were not nearly so pronounced as with the exterior manifold, still the experiments proved that heat applied to the mixture has a most profound effect upon engine performance and economy.

Reduced to a comprehensive table, the results of the experiments are shown in tabulated form herewith.

(The concluding article of this series will go into glass manifolding experiments more deeply and also deal with the subject of "hot spotting.")

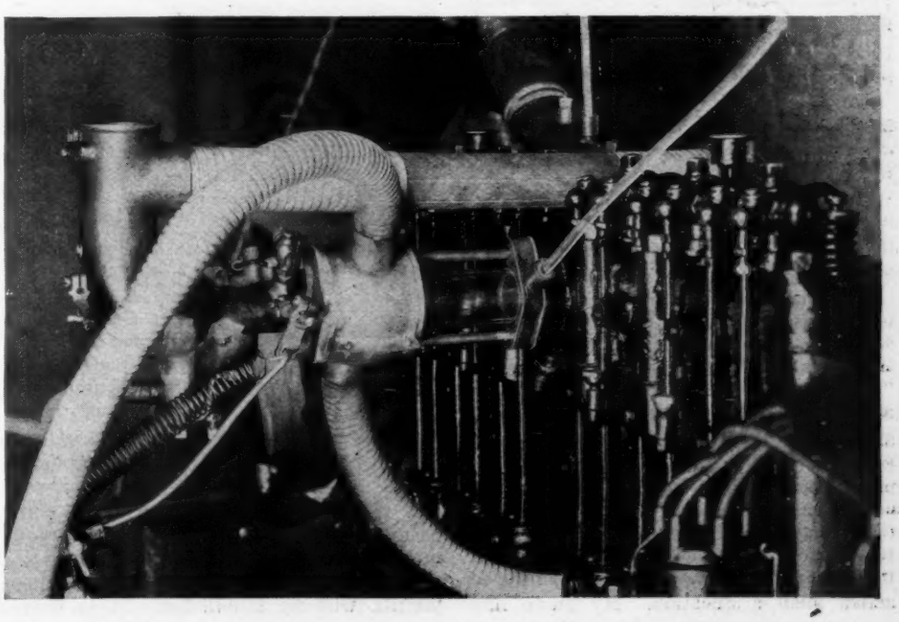


Fig. 10—Apparatus used to examine the effect of "hot spotting" with a horizontal carbureter and an internal manifold

The SERVICE MANAGER Speaks:

Mr. P. E. Chamberlain, Well-Known Exponent of the Flat Rate System, States Why It Is Fair to All Classes of Customers

AFTER all that has been said and written concerning the practical operation of the flat rate method of repairing automobiles, since my first series of articles in Motor Age in 1919, it would seem that the service manager whose doubts were expressed in the Aug. 4 issue of Motor Age, has already been answered. The best answer that could be given him is the fact that the flat rate is being used by hundreds of organizations, handling all makes of cars, in all sections of the country, and that no one who has worked it out in his own organization would think of going back to the per-hour method of charging.

However, this service manager thinks that it may be a temporary relief only and raises some other points in connection with it which, if answered, might prove beneficial to others as well as himself.

Is the flat rate a temporary method of satisfying the customer until the public gets more motor wise?

Many things which have been done in the automobile business for years are fundamentally wrong. One of them is the method of pricing repairs to the customer—on a per-hour basis. It is hard to unlearn anything, and yet this often must be done before the mind can be receptive to the proper method of replacing the one now in vogue.

In order to get the proper idea of the flat rate it is necessary to admit first of all that we should determine the price to the customer on a basis of cost-plus-overhead-plus-profit. In this way, and only in this way, can we deliver service in the broader meaning of the word and get paid for it.

The automobile man has raised the per-hour question in the owner's mind. Nowhere else does he encounter it. If this service manager is quoting me as "the father of the flat rate," let me say that while the repairing of a pair of shoes is, of course, technically different from the repairing of an automobile, the psychology of both is the same as far as the customer is concerned. It never even occurs to the owner of the shoes to ask how long the repairman worked upon them. The watch repairer is never asked such a question. My piano has been tuned several times, never in the same length of time, but always at the same price.

P. E. Chamberlain, formerly manager of the Denver Cadillac branch and now touring the country with his lectures on "Selling Service Intelligently," "The Woman in White" and "The Flat Rate Method of Repairing"

We must realize that we are not selling time. We are selling results. We are contracting to perform a certain service for a certain amount and the actual time put in by the workman is only a part of the cost.

I cannot, at this time in an article of limited length, analyze the cost elements. But it is a fact that on the per-hour basis it has ever been a problem how the repair department is to get paid for all of them. The floorwalker in the department store is paid for by the customers of the store in an overhead charge—a courtesy part of that store's service. The time of the clerk in returning goods to the shelves is also paid for in this way—non-productive time, but necessary to the business. All of these elements are fundamentally the same, or should be, in the automobile establishment.

If the per-hour idea of charging will be entirely disregarded and the contract method of buying and selling labor substituted, about 95 per cent of all complaints will be eliminated. It is easy to "think for the customer," but when, after months and even years of practical operation, the customer never raises these points himself, it is evident that they do not enter into the picture at all.

The flat rate is permanent because it is the practice which generations of trading have made the fundamental law governing the intercourse between merchant and customer.

When the public gets more "motor-wise" its wisdom will show that the same elements enter into all business transactions; that quality enters into the automobile repair as into anything else; that the service demanded consists of three parts, one before and one after the actual act of service. That for all of these things he must pay, provided they are on a basis of organization efficiency.

The per-hour charge has always been determined from the fact that "everyone else charges this rate." Practically the entire country works and has worked for years on the same basis, regardless of local conditions of labor, building arrangements or equipment. On this basis the service rendered is limited to one charge, and the repair department having greater overheads, or located where labor conditions are unfavorable, must either curtail the quality of service rendered or lose money. Neither builds permanently.

The desired recommendation is: "You pay for it but you are sure to get good service." Any plan, no matter how fundamentally sound it is, must be accompanied by proper selling methods, and that means proper education of those employees who have to sell it intelligently to the public.

Are there many injustices in the flat rate plan?

There are none. The service manager says it occurs to him that there are many but he names but one. This one has been named hundreds of times and indicates that he has not made an analysis of the matter covering a period of months. The price is never determined on a basis of two jobs—one taking two and a quarter hours and the other taking two men five hours. There are always those two jobs, but the flat rate price is determined on a basis of a hundred or several hundred jobs. Thus the few long-time jobs add but a mite to the average.

If the service manager will pick any 25 cars in the hands of any 25 owners

and keep track of the repair work on them for a year he will get some real information which will set his mind at rest along this line.

Then, too, this fact is always overlooked: accompanying the flat rate must go an understanding of how to make an intelligent estimate. If a wreck is towed in, it does not destroy the theory or practicability of the flat rate to treat this case as a special matter for individual estimate and pricing. The fact of the matter is that such operations as straightening an axle, taking dents out of fenders and things of that nature, are usually not priced in advance. They are estimated in each case, the estimate then becoming the flat rate for that particular job. Why not work on them on the per-hour basis? Because, as stated, we must eventually get entirely away from the per-hour idea. Neither employee nor customer should have it in mind. The time put in on an operation should be used only in calculating averages and determining costs.

Does the customer pay for lost time, stopping, starting, testing, etc?

He should, but as an overhead. Time put in on an operation should be the time the mechanic actually works on that operation only, and moving the car, covering it up, testing, cleaning after the work is completed should all be done by cheap labor, which will hold the overhead down. While the customer should pay for it, the payment should be made on a basis of efficiency. It is not right that he should pay an expensive mechanic for work that a $10-a-week boy could do. This means specializing—more employees, perhaps, but with a smaller total payroll.

If these things are properly understood the flat rate will, as a matter of fact, reduce the owner's maintenance expense over a given period rather than increase it. Specializing is a part of proper merchandising. The $10,000 a year executive cannot afford to write his own letters. Neither can we afford to have the mechanic pump up tires nor the service manager or shop foreman "shag" parts.

Is it not the equipment and personnel of the large shop which uses the flat rate which makes it successful rather than the flat rate itself?

Positively not. Could the service manager have visited with me the hundreds of automobile establishments I have visited, he would not ask this question. Size does not mean success. I know large establishments having everything that money can buy, which are losing money in their repair departments hand over fist. I know small repair departments which are making money with little volume.

Good will is not established because of buildings, desk, tools, equipment or personnel. Anyone, having the money, can purchase such things. Good will is established by the things which money cannot buy—by the spirit of service, by proper methods, by strict observance of those things which draw the line between the legitimate merchant and the shyster.

It is easily to be seen that past methods have not brought about the result to be desired by any merchant or by an industry—the respect and confidence of his or its clientele. This is evidenced by newspaper cartoons, stage jokes and unfair legislation. As an example: we have spent a good many millions of dollars, through the so-called "policy adjustment," in an attempt to buy or bribe the goodwill of the public. If this were the way to get it, we would have it.

At the finish of a transaction which has been handled in a loose, haphazard manner from its start, the "policy adjustment" may be necessary. But the way to prevent it is to start at the beginning and make every transaction so definite that the complaint will be exceptional.

To do this means, first, the willingness to recognize a need; second, the ability to search out the cause of the unfavorable condition; third, the initiative to suggest a remedy; fourth, the ability to put the remedy into practical operation in the organization.

The easiest place to dam a stream is at its source. The easiest way to correct an unfavorable business condition is to remove the cause.

Denver Dealers Put on Outdoor Show to Good Advantage

Denver, Aug. 20—Local dealers profiting by their recent experience with an outdoor automobile show, advise dealers throughout the country to follow Denver's example and get business.

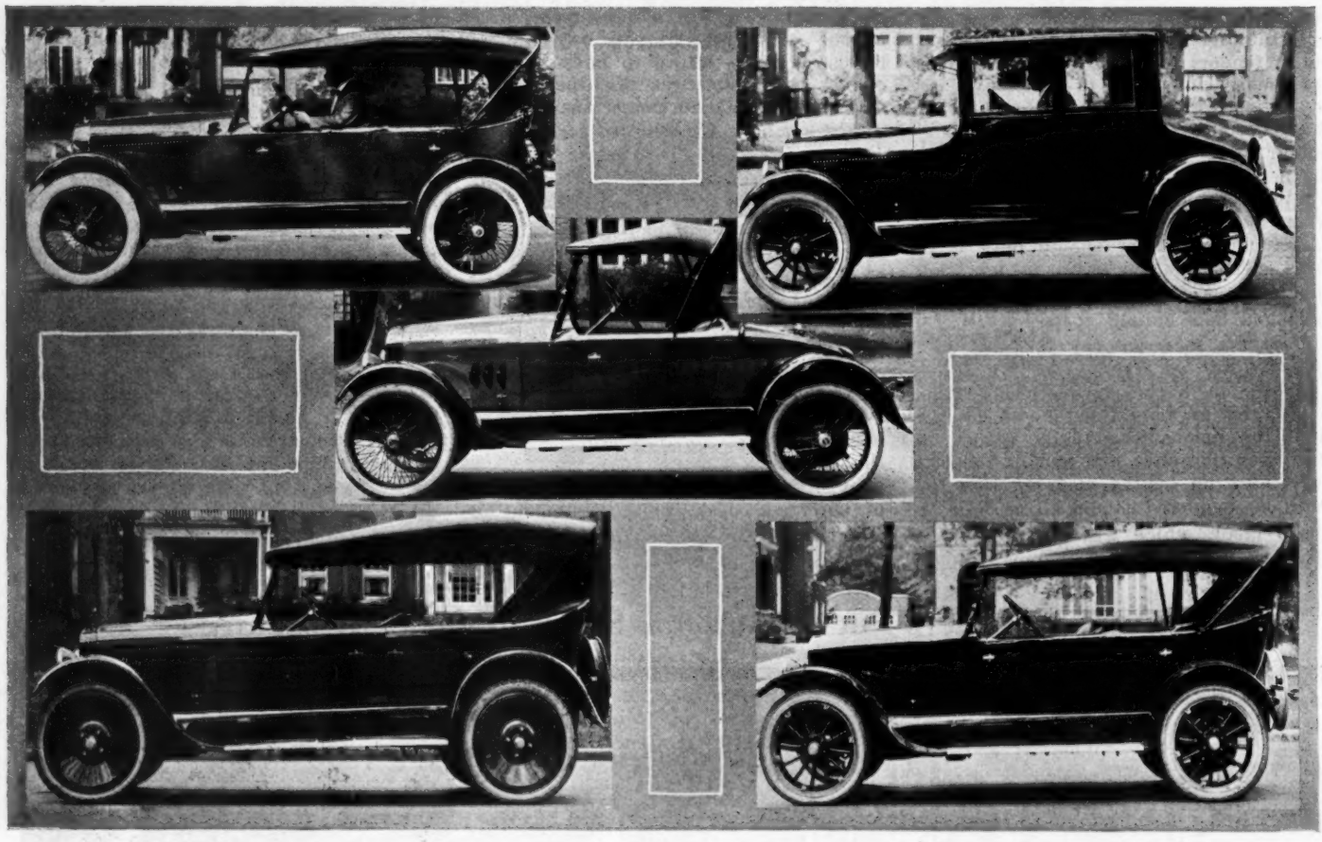
Denver's first summer show was held in the open during the second week in August and was very successful. The objection usually raised against expositions of this kind—the claim that crowds cannot be held for sales ends—did not obtain at Denver. It was found that it was easy to hold the visitors and that the show was a powerful factor in interesting many persons in the ownership of a car. Many actual sales are credited to the exposition, and the stimulus given to business promises to be far-reaching.

Local dealers declare that the outdoor setting for cars, such as was furnished at the recent show, offers the best possible condition for selling; formalities were absent to a large degree, and visitors were made to feel more at ease than would have been possible under the usual show conditions.

A feature that contributed greatly to the entertaining side of the show was a snowball fight between companies of Boy Scouts, the snow having been brought down from the mountains.

Several New Models Announced

Columbia Motors Brings Out 1922 Cars, Including a Five-Passenger Touring to Sell for $1475. Elgin Adds a Roadster



Five of the new models announced by the Columbia Motors Co., Detroit. The DeLuxe models are those in which the hood is made with a large number of louvres instead of the three louvres which have characterized the Columbia line for a long time

THE Columbia Motors Co., Detroit, has announced its 1922 line, with prices effective Aug. 15. The high spot in the announcement is a new five-passenger touring model, known as the DeLuxe model, to sell at $1475. Similar low prices are announced for the rest of the line along with a cut of $300 on the Challenger model recently put out. The price of this job, a five-passenger touring car of 115-in. wheelbase, is announced at $1195, a figure which brings it within a few dollars of being the lowest priced six-cylinder car on the market today.

The DeLuxe touring model, while incorporating features new to the Columbia line, is designed along conservative lines. The body is well proportioned as regards the front compartment and the tonneau, and is mounted on a chassis of 115 in. wheelbase. The DeLuxe touring has long body lines, deep-drawn crown fenders, a many-louvered hood and non-collapsible top. The upholstery is leather and the top is Pantasote.

Two other open models are included in the line, a roadster and a sport model, both selling at $1,475. Two closed cars, a coupe and a sedan, complete the standard line, specifications of which follow:

Seven R Continental engine, Atwater-Kent ignition, Prest-O-Lite battery, Auto-Lite starter, motor and generator, Stromberg carbureter, Harrison radiator, Borg & Beck clutch, Spicer universal joints, Durston transmission, Gemmer steering, Timken front and rear axles, Detroit steel springs, Prudden wheels, Firestone and Goodrich cords, Pantasote top, Boyce motometer.

In addition to the above units, the standard line is equipped with thermostatically controlled radiator shutters and non-synchronizing springs. The De Luxe touring also is equipped with the flometer.

Besides the Challenger 5-passenger touring, there are two other models in the Challenger line, a sedan and coupe, listed at $1,995. The three Challenger models are built on a 115-in. chassis on which are mounted substantial bodies differing slightly in style from the reg-

Prices of the Columbia's 1922 Line

F. O. B. DETROIT

DeLuxe touring, 5-pass	$1,475
Sport model, 4-pass	1,475
Roadster, 2-pass	1,475
Coupe, 4-pass	2,295
Sedan, 5-pass	2,350
Challenger touring, 5-pass	1,195
Challenger coupe, 4-pass	1,995
Challenger sedan, 5-pass	1,995

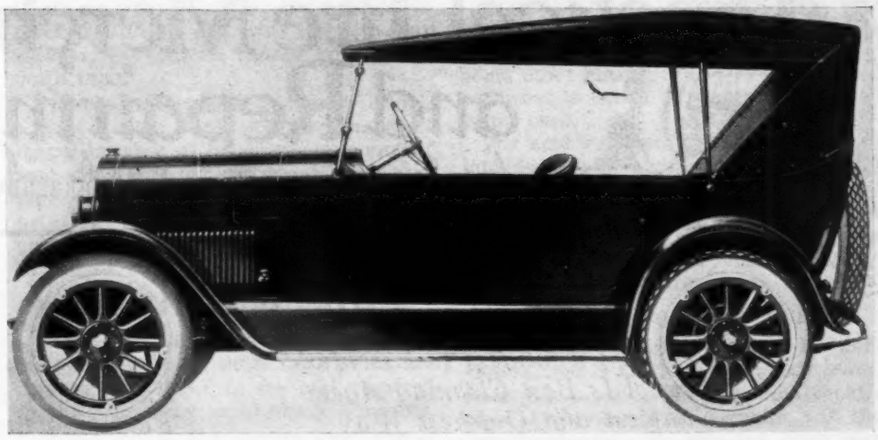
ular line. The Challenger has the Reutenber engine, Adams rear axles. It is not equipped with automatically controlled radiator shutters.

A goodly number of orders for the new cars have been placed and production at the factory has now been increased to the highest point of this year.

DODGE HAS NEW SEDAN

Dodge Brothers have made some changes in the design of the sedan, the new models of which are just beginning to come to dealers. The total height has been reduced four inches, but the most conspicuous change is the introduction of steel disk wheels. The inside arrangements have been shifted somewhat, the divided front seat being eliminated and a solid seat used instead. The door arrangement has also been changed; there are now two doors and the shape of the glass windows has been changed to a square type.

Durant Four Built Along Conservative Lines



This side view of the new Durant Four gives a good idea of the body and top lines. There is a decided rake to the steering column. This car was described in last week's issue of Motor Age

ELGIN ROADSTER

Elgin has added a roadster to its line. It is built on the standard Series K-1 chassis. The running boards have been eliminated, and special steps are attached to the frame beneath the doors. Fenders are also of novel design, the rear fender having a reverse curve at the front and rear. Five white wire wheels are standard, adding a touch of distinction. Cord tires, 33 by 4 in., are included in the equipment.

The upholstery is of Spanish leather and a roomy luggage compartment is located under the rear deck. It is accessible through side doors, provided with locks. This compartment is large enough to easily accommodate suitcases and handbags. A package container is provided in the seat back. An extra long gear shift lever makes gear changing easy and convenient. Other equipment includes bar radiator cap with motometer, French side lights, outside door handles and leather door pads.

The width of the seat is 40 in. It is set slightly lower and a little farther back than on the touring model, giving more leg room and more space between the seat and steering wheel rim. Distance from the back cushion to the steering wheel rim measures 13 in.; and from the seat cushion to the steering wheel, 8½ in. Body and hood are furnished in either of two colors: chrome yellow or sagebrush green. The sheet metal is black enamel. The price of the roadster is $1595 f.o.b. factory.

HAYNES 55 IN THREE BODY STYLES

The Haynes Automobile Co., Kokomo, Ind., has announced the 1922 Haynes 55, a light five-passenger six-cylinder touring car at $1785 f. o. b. factory. The Haynes 55 is also manufactured in the roadster and sedan body.

The car, though similar in many respects to the Haynes 50, has additional features. Individual fenders and aluminum steps and exterior side cowl lamps are standard equipment on this car.

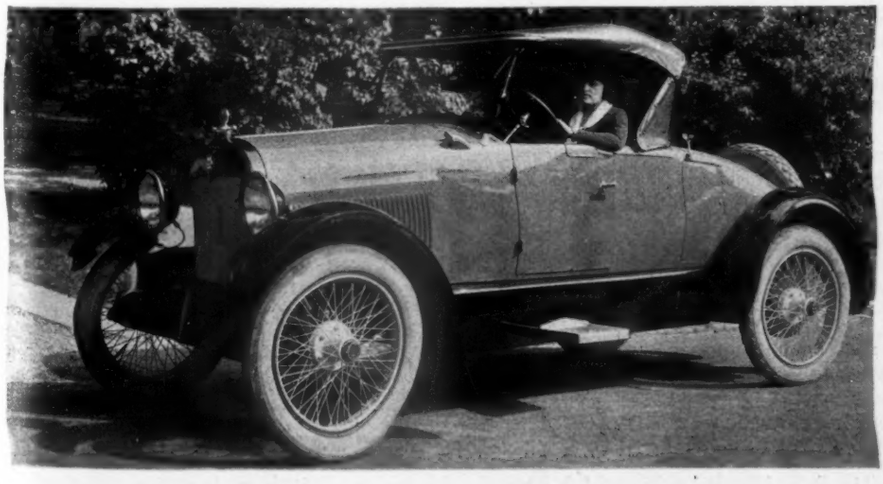
The high, broad-arched hood gives the car an individual appearance. The finish is Brewster green. A one-man top of waterproof material is used and the rear curtain is carried around the sides of the body to the top bow. A bevel plate glass window with a nickel plated frame adorns the rear quarter of the top. The curtains are close-fitting and open with the doors.

The battery and tool compartments are conveniently placed under the front seat. There is additional carrying space under the rear seat. A heavy pressed steel covering is placed over the gasoline tank at the rear of the frame.

The frame consists of 6-in. channel section side rails with five cross members to insure rigidity and prevent side sway.

The electric starter is controlled by a magnetic switch operated by a finger button on the instrument board. Four cord tires, 33 by 4 in., and a spare tire carrier attached to the rear of the frame are standard equipment.

Elgin Brings Out New Roadster



The smart-looking roadster which the Elgin Motor Car Corp. has added to its line

LEACH HAS NEW ENGINE

New models of the Leach Power Plus Six are being displayed for the first time by the Leach Biltwell Motor Car Co. of Los Angeles during the first annual Industrial Trade Exposition. The new models are equipped with a special motor, have a much longer wheelbase, and are better equipped than those of the 1921 style.

A new motor recently adopted and constructed by the company also is being displayed. It is a six-cylinder, valve-in-head type, and develops 107 horsepower, according to final tests. The company is now manufacturing five models of cars, which may be converted in an instant from open to closed with California tops and are exceptionally well equipped.

Tube Repairing

Perfect Cleanliness Is Essential
Benzol Is Best Cleaning Agent
Simplest and Quickest Way
Using a Rubber Rivet
Approximate Curing Time
Repairing Blowouts in Tubes
Applying Inside Reinforcement
Fill Holes Up Flush
Repairing Longitudinal Rips
When to Use the Splice
Formula for Acid Cure
Applying New Valve Base
Push Valves in the Tube

UNLESS the injury to the tube is plainly visible the first step in making a repair would be to test the tube and locate the puncture. This can only be done satisfactorily under water.

As soon as the puncture is located it should be marked with an indelible pencil in such a way that subsequent buffing or roughening will not obliterate the marks.

PERFECT CLEANLINESS IS ESSENTIAL

It is extremely important to bear in mind that good amalgamation between the tube and the new repair stock is dependent upon perfect cleanliness. For this reason no pains should be spared to see that the surfaces of the tube and repair stock are perfectly clean and free from dust or oil.

BENZOL IS BEST CLEANING AGENT

To be on the safe side it is far better not to use gasoline at all but to substitute benzol for it. This can be obtained from any large wholesale chemical house and costs approximately 50 cents a gallon in small quantities.

SIMPLEST AND QUICKEST WAY

The simplest and quickest way to repair small injuries is to apply a coat of cement over the puncture and for approximately an inch all around it and allow this to dry until the cement becomes tacky—that is, feels sticky to the finger but will not stick to it.

A small piece of tube repair stock is then cut to cover the injury and lap over approximately one-half inch all around it.

The holland is removed from the tube stock and the fresh, clean side pressed down firmly over the injury and thoroughly stitched in place with a beaded rolling wheel called a stitcher.

The whole area is then dusted with soapstone or talc and cured on the tube plate at 50 pounds pressure for from five to ten minutes.

Different manufacturers recommend higher or lower steam pressures and slightly longer or shorter times for curing, depending upon the characteristics of their particular repair stock. Such instructions are always supplied with the stock and should be followed very closely for best results.

When the cure is complete, the raw rubber will have become thoroughly amalgamated to the tube and when dented with the point of a lead pencil no impression should be left.

USING A RUBBER RIVET

The other method of repairing small punctures is first to slightly enlarge or "pick out" the injury into an open hole about the diameter of the lead in a pencil. The area around the hole is then buffed clean and cemented as in the previous case.

The next step is to cut a very narrow strip of tube stock—a sort of thick thread, in fact—and with a sharp-pointed tool force the end of the thread through the hole, after which operation it is cut off about 1/64 inch above the tube.

The cure is performed as in the first mentioned instance. When a repair of this kind is made, the result is that the thread of rubber forced through the hole becomes a sort of rivet and seals the aperture both inside and outside the tube. This repair takes somewhat longer to make, but results in a very neat workmanlike job and leaves very little scar.

The last method is the one that must always be used where the puncture is of considerable size, such, for example, as one that would be made by a very large nail or perhaps by a piece of loose car track or glass or a sharp stone.

In such cases it is well also to supplement the repair by applying a square or circular piece of tube stock over the rubber plug, thus making doubly sure that the injury is strongly and thoroughly sealed.

APPROXIMATE CURING TIMES

It will be understood, of course, that if it is necessary to apply two or more thicknesses of repair gum the length of time required for the cure will be proportionately increased. In other words, while one thickness will cure probably in 7 to 10 minutes, it will be necessary to allow perhaps 12 to 15 minutes for a proper cure on two thicknesses and probably up to 20 minutes to cure three thicknesses.

Blowouts are likely to leave rather large and somewhat jagged holes in the tube. Repairs of this kind require somewhat more extensive treatment because ordinary tube gum applied to the outside would not give sufficient strength. Therefore, it is necessary to reinforce the repair from the inside.

REPAIRING BLOWOUTS IN TUBES

The first step in repairing a blowout is to very carefully trim the edges of the injury with a pair of sharp shears leaving clean-cut, smooth edges for amalgamation to the repair gum.

Ask Us!

ASK US!

This series has been made intensely practical in nature, FOR YOU. It is for you to use, to put to work. But there may be some points in the articles you do not thoroughly understand.

ASK US!

We're here to answer. We want these articles on tire repairing and merchandising to be of the

GREATEST POSSIBLE VALUE!

Ask as many questions as you like. Ask any kind of questions. The Editor will answer them.

The area around the hole both inside and outside should be thoroughly buffed. The whole injury is then thoroughly cleaned with benzol or high-test gasoline.

It is important to see that every vestige of soapstone or sulphur-bloom is removed from the inside of the tube, as otherwise there will not be proper adhesion between the inside reinforcement and the tube.

APPLYING INSIDE REINFORCEMENT

For the inside reinforcement a somewhat different grade of repair stock is used. This is known as "combination gum" and consists of a thickness of semi-cured stock to which is attached a thickness of raw stock. The raw stock is for vulcanization to the tube; the semi-cured stock is used so that it will not adhere to the inside of the tube during the process of curing.

After the injury has been thoroughly buffed and cleaned, a piece of combination gum large enough to overlap the hole by nearly one inch all around, should be cut. After the holland is stripped from the back the gum should be gripped in the center with a pair of sharpnosed pliers, the semi-cured side being down. It is then wet with benzol or high-test gasoline in order to make it slippery and is easily manipulated into place in the hole in the tube and centered. Sticking with the beaded sticker follows.

FILL HOLES UP FLUSH

The next step is to fill up the hole flush with the top of the tube, using scraps of tube gum or pieces cut to fit. With the hole filled up, the aperture must then be covered with a single thickness of tube-gum; approximately the same overlap should be allowed as in the case of the inside reinforcement.

This last piece of gum should be thoroughly stitched into place, care being taken that no air is imprisoned under it. If air bubbles appear they should be pricked with an awl, and when the air escapes, the bubble should be stitched down tight.

The length of time required for curing a job of this kind will be somewhat longer because of the greater amount of raw stock used. If the repair is an extensive one it probably will be necessary to allow 25 to 30 minutes to effect a proper cure with the steam pressure at 50 pounds.

REPAIRING LONGITUDINAL RIPS

Long rips in tubes which may be caused by running on a flat tire or are the result of a pinch, are best repaired in the same way as ordinary blowouts.

If the rip is not a very long one it probably can be cured in one operation, and it is desirable to do so, whenever possible, in order to avoid variations in the degree of cure over the entire length of the repair. If the rip is such a long one that two or more cures are necessary, great care should be taken to see that the steam pressure and the length of time are exactly the same for each, so that the finished job will have exactly the same elasticity throughout its length. Otherwise it will stretch a little more in one place than another and thus may cause the repair to give way.

WHEN TO USE THE SPLICE

Because of the strain on tubes under inflation and of the hinging action caused by the tires rolling over obstructions in the road, it is not generally considered good practice to attempt to vulcanize an extensive rip which goes around the tube.

Such repairs are best made by splicing in a section from another tube. Where this is done, the section used for splicing should be of the same color as the tube being repaired and of as nearly the same weight as possible.

Inasmuch as it is impossible to vulcanize such a section with any success, it is necessary to complete the cure by some other means. For this purpose we use what is called an acid cure, no heat being used.

For acid cure work a special cement, intended for this purpose and for this purpose alone, is necessary. It is impossible to use the ordinary vulcanizing cement for acid cure jobs. Acid cure cement can be obtained from any of the manufacturers of tire repair materials.

FORMULA FOR ACID CURE

Acid cure generally cannot be purchased from makers of tire repair materials, but is easily made by the repairman. Following is the formula, and the ingredients can be obtained from any wholesale drug house:

1.7 fluid ounces of sulphur monochloride ($S_2 Cl_2$) to one gallon of carbon tetrachloride (CCl_4).

The tools necessary for splicing include a set of mandrels of various sizes to fit the various sizes of tubes.

APPLYING NEW VALVE BASE

That part of the tube to which the valve is attached is called the valve base. This is an oblong combination of rubber and fabric. Rubber alone cannot hold the valve; therefore, the rubber is reinforced with one or more layers of fabric, the rubber and fabric being vulcanized together to form one homogeneous mass.

When tires are run flat, thus causing the valves to be pulled out, the fabric in the valve base is almost invariably ruptured. Inasmuch as it is impossible to repair such a break, the only remaining procedure is to remove the old valve base and apply a new one.

When for any reason it becomes necessary to remove a valve, as for example

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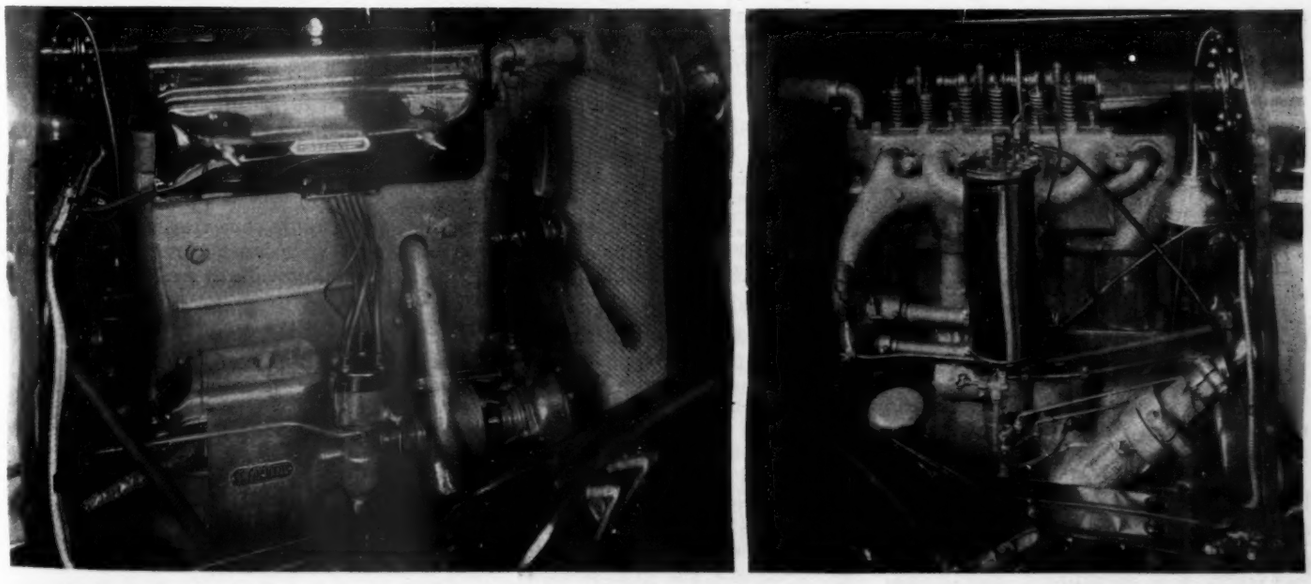
Two Views Showing the Mechanical Features of the New Buick Four Engine



Left, right-hand side of the engine, showing the accessible positions of the distributer and water pump. The other view shows the induction and exhaust side, also the valve cover removed

EDITORIAL

Concerning Legislation

THE news from Washington indicates that the representatives of the automotive industry who are there asking fair treatment in the question of taxes, are giving an excellent account of themselves. This is indicative that two principal ideas put forth by the leaders of the industry are being accepted by the legislators. They are—

That the automotive industry, as a transportation industry, is essential.

That the automotive industry is quite willing to pay a just share of taxes.

The fact that the national legislature is accepting this view of the industry is certain to be reflected in the minor legislatures, by which we mean state, city and village legislatures. But this filtering down of the fair legislative treatment idea will not lessen the task before those who would do an essential service for the industry. This means, of course, an essential service for the owners of the individual vehicles.

Every unfair and restrictive ordinance or law means a limit on the use (and consequently the sale and maintenance) of automotive vehicles. It is a service that the industry owes to its customers, to use every fair and legitimate means to protect the vehicle while in use. Every man who is making his living in the industry should use his personal influence as a voter and as a business man and industrial leader to promote fair and to halt unfair legislation. In order to do this, he should become acquainted with the legislators from his ward, congressional district and state and with those who have influence with legislators. He should assert himself at every opportunity by personal interview, letter or telegram.

But above all, in making legislative requests, he should never ask for special favors and should at all times be quite willing that the industry, as represented in his community, and that vehicle owners should shoulder a fair share of the community burdens. Half of the battle is in the fairness of the position taken.

About Two Dealers

AN interesting story was related in this office recently by a man who holds confidential relations with many automotive dealers. He was telling of two men, comparable as dealers because of their basic investment, of their experience and of the price of the vehicles they sell. The men are business neighbors, both prominent on the same motor row. Both men sold many cars during the last few years and made much money.

No. 1 gave his full attention to the selling end and let the various other departments run pretty much as they pleased. He knew that his maintenance department was losing money but as long as he was making so much selling cars he did not worry, and charged his loss to advertising. The same process covered any other losses. He employed many salesmen, and for every car that came from the factory there were three sales. When sales checked, he eased the sales expense by discharging most of his salesmen.

No. 2 kept down his selling expenses while selling was good and was never much over-sold. Only four men were on his sales staff at that time but he was able to place immediately every car shipped to him. He did, however, give a lot of attention to his departments and last fall found him with every department in his establishment on a profit basis. He did not pay much attention to the mere selling of cars until the reports showed him that his sales were not keeping up with deliveries. He went through the winter without loss, and beginning early in the spring he employed more salesmen, eventually building his force up to 14, and he is getting all the cars that this force can sell without trouble.

Today No. 2 is making a nice profit out of his business, while No. 1 is wondering how he can stop his losses.

There are two lessons here:

One is, in time of prosperity, prepare for famine; the other is to fight hardest where resistance is strongest.

Organizing for the Job

THE actual work of installing a new camshaft gear, adjusting the ring gear and pinion of the rear axle—or whatever the job may be—can be made much easier if the man who is going to do the job organizes for it. Preparation for the job, including such items as cleaning the parts to be dissassembled, selecting the tools actually needed for the work, taking the necessary steps to do the job—with the minimum amount of human effort—are big factors in so organizing shop work that it will pay a profit.

It is altogether too common to go into a shop and see a work bench cluttered with tools and parts and only a small space of about two square feet in which the mechanic may work. One of the easiest ways in which to judge the efficiency of a shop is to scan the floor and benches. It is true that automobile repairing is, of necessity, more or less mussy work, because cars travel over all sorts of roads ,and grease and oil are essential to the proper operation of a car. But in spite of this fact, a good shop or service station will so plan its work that a woman driver who enters the shop need not fear soiling her clothes with a gob of grease or stepping into a pool of oil.

The shop might well learn a lesson from the operating room of a hospital, where preparation for an operation is held fully as important as the operation itself. Besides making a good impression on the customer, which, after all, means repeat sales, a well-conducted shop makes it easier for the men to turn out good work and for the shop to pay a profit.

Townsend Bill Loses Highway Commission

Texas Dealers Set Strong Pace in Automobile Sales

Many Distributors Say They Have Pushed Business Back to Normal and Even Past

DALLAS, Aug. 22—The automotive business in north Texas, Oklahoma, parts of Louisiana, New Mexico and Arizona, supplied by Dallas dealers and jobbers, continued to show improvement during the first half of August. Many of the retailers in Dallas and other parts of the trade territory reported their business back to normal and even surpassing the banner days of two years ago. Others said the business was as good as could be expected.

The selling of cars has been augmented by the presence of some $100,000,000 from the grain and fruit crops. This money is now in general circulation and the buying has been rather brisk. Retailers have noticed also that buyers are paying cash, or considerably more cash for cars than they have been for many months. This, they declare, makes the business generally better.

Accessory Men Report Brisk Business

Accessory men from all sections of the territory report brisk business, and tire dealers claim their business was never better. One thing making the accessory and tire business much better than it has been for months is the thousands of cars from other states now touring Texas. Automobile dealers declare there have never been so many automobile tourists in this section of the country.

Trailer and truck dealers have also found business increased and prospects generally brighter, especially in the grain and cattle belts.

There is a 3,000,000-bale cotton crop predicted for Texas. The gathering and marketing of this crop will begin before Sept. 1. For months the automotive business has been dull in the cotton belts of Texas because the farmers were without money. Retailers, accessory and tire men are ready to invade these cotton belts with the very latest products of the manufacturers as soon as the crop begins to move. They anticipate a brisk business during the remainder of the year.

Dallas dealers are adding considerable territory to their present quotas and are laying plans for the biggest business yet in 1922. Wholesalers report retailers are placing orders for heavy shipments this fall and urging that arrangements be made for prompt deliveries next year. These retailers tell their jobbers in Dallas that there has never been a time in the southwest when the automobile, trailer, truck and tractor have been in such demand and that they must be equipped to handle the business or see it go elsewhere. The Dallas jobbers say they will be able to care for their trade.

Jobbers are assisting their out-of-town dealers by furnishing expert salesmen without charge for special cases. Also they are writing advertisements for their dealers, and it is said in some instances are helping to pay the bills where those ads are run.

Dealers in Close Touch with Owners

Dealers are keeping in close contact with owners of their cars. They are making every owner a salesman for their products. When the new owners do not come to the service stations often enough, once every two weeks these owners are phoned to bring the car down to be looked over, or are sent a personal letter asking if anything can be done toward bettering the service of the car. Dealers even inquire how the gasoline burns. Some times they find the gas has been tampered with and they help the owner to remedy this. If the new owners will not come in, a man from the station is sent out to see them and talk over the working and running of the car with them.

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Gen. Roberts Denies Sale of New Government Cars

Atlanta, Aug. 15—Numerous reports that the United States government has been selling new motor cars at ridiculously low prices were said to be without foundation of fact by Quartermaster General Roberts in a letter written the early part of August to Senator Harris of Georgia.

The Georgia senator took the matter up with General Roberts on behalf of the automotive dealers of the state, receiving the following letter from General Roberts:

There are persistent rumors going around that the government is disposing of new Dodge cars. These rumors are without foundation, as we have no new cars in the army and at the present time there are no passenger-carrying vehicles for sale. Vehicles which have been sold to the public were sold at auction to the highest bidder and were in an unserviceable condition.

CRACKER DEALERS INCORPORATE

Atlanta, Aug. 19—The Georgia Automotive Dealers' Assn., organized several years ago, has been incorporated in Georgia for a period of 20 years. The petition for charter states that the purpose of the organization is "to encourage cooperation between dealers in automobiles and automobile accessories; to help build roads and highways, and to better conditions in the automotive industry."

Senate Eliminates Highway Commission From Road Bill

Surprise Vote Also Cuts $25,000,000 From Proposed $100,000,000; East Kills Provision

WASHINGTON, Aug. 22—Eliminating the provision calling for the establishment of a federal highway commission, the Senate passed the Townsend highway bill appropriating $75,000,000 for the construction and maintenance of roads, one-third of which will be available immediately, and the balance to be distributed within six months. It was for the recognition of this highway commission plan that the automotive industry conducted a strong legislative campaign. The defeat was brought about by an unexpected eleventh-hour change of front on the part of Senate leaders. It is believed that the opposition developed not because of the industry's advocacy of it, but owing to the growing evidence of a reaction against bureaucracy or investing power in new commissions.

Senators from the eastern states, where the highway system is fairly well developed, were quick to oppose the appropriation of $100,000,000, as proposed by the Senate Committee on Postoffice and Post Roads. Senator Lodge, Republican leader in the Senate, insisted that it was only fair to the taxpayers of the country that economies should be made in road expenditures as well as in other forms of governmental enterprise. An effort was made to cut the appropriation in half.

Distinct Surprise to Senators

The movement to abolish the highway commission, as proposed in the Townsend bill, was a distinct surprise to Senator Townsend and southern Senators who had heretofore opposed any change in the distribution of federal funds, but later agreed to a compromise bill. Representative leaders declared that their action was based upon the fact that a report will be received shortly from the reorganization committee now planning the redistribution and reorganization of government departments. It is believed that the control of highways, which is now vested in the Bureau of Public Roads, Department of Agriculture, will be transferred to a separate highway bureau in the proposed department of Public Roads, or to the Department of Commerce, because of the gradual recognition of the fact that highway transport and transportation affects business more than agricultural interests.

The bill as reported from the committee would probably have passed with the commission plan intact if a delay had

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Mellon's $10 Tax on Cars Left Out of House Bill

No Additional Revenue Burdens Placed on Automobile Industry In Ways and Means Measure

WASHINGTON, Aug. 23—No additional taxes were proposed for the automobile industry in the tax bill as reported by the House Committee on Ways and Means. The Federal flat tax of $10 per car and other modes of assessment on automobiles suggested by the secretary of the treasury were not mentioned in the committee bill. However, the committee failed to remove the discriminatory excise taxes which are known in the industry as "stigma" taxes.

The amendment to the excise taxes relating to accessories merely changed the wording of the subdivision. The amendment would make subdivision 3 of Section 900 of the Revenue Act of 1918 read as follows:

"Tires, inner tubes, parts, or accessories for automobile trucks, automobile wagons, other automobiles, or motorcycles sold to any person other than a manufacturer or producer of any of the articles enumerated in subdivision (1) or (2) or in this subdivision, 5 per centum."

Politics Molds Bill

There is strong evidence that the House bill was drafted more for political expediency than for practical purposes. The belief exists that the yield contemplated in the House bill will fall far short of the revenue necessary to maintain the Federal government. There is a feeling that the House bill will be revised in the Senate in order to provide sufficient funds.

The repeal of the excess profits tax has met with widespread approval. The only objection is made by the American Farm Bureau Federation because they believe it is a discrimination in behalf of organized business. Automobile manufacturers and dealers favored the abolition of this tax because it is generally undeterminable and conducive to excessive litigation, and is admittedly one of the chief causes of high prices.

The Republican conference changed the proposal of the House Committee on Ways and Means in order that the repeal of the excess profits tax and the reduction of the surtax and the 2½ per cent increase in corporation taxes should become effective Jan. 1, 1922, instead of January, 1921. This change means that merchants will be obliged to pay taxes on the calendar year, a period which has been characterized by depression.

A number of changes have been made in the administrative features of the present law at the suggestion of treasury experts. Among them is a provision authorizing the secretary of the treasury to settle disputes over back taxes without resort to the courts. It is proposed to establish a tribunal to pass upon claims and the time for their settlement would be reduced from five to three years, unless extension is ordered by the secretary. It is the belief of officials of the treasury that this will make much easier the collection of taxes now in dispute, estimated to total approximately $1,500,000,000.

It is explained that the reduction of 32 per cent of the highest income and surtax brackets is expected to produce actually more revenue from these sources than do present higher rates. The latter, it is stated, prevent transactions which would involve application of the high rates, and thus keep taxes away from the government.

Under a special rule, the bill was passed and forwarded to the Senate, but the recess of Congress until late in September will delay the final enactment until October, and the same is true of the tariff bill.

HUDSON MAKES THIRD REDUCTION

Detroit, Aug. 23—The third reduction in price since the readjustment process began has been made by the Hudson Motor Car Co. The prices, which are effective immediately, follow:

	New Price	Old Price
Hudson		
Touring	$1895	$2250
Coupe	2770	3125
Sedan	2895	3250
Essex		
Touring and roadster	1375	1445
Coupe	1880	1950
Sedan	2230	2300

Prices of the other Hudson models are: cabriolet $2495, touring limousine $3120, and limousine $3495.

Essex touring and roadster is repriced at $1375; sedan $2230; carbriolet $1880.

KOEHLER REDUCES PRICES

Bloomfield, N. J., Aug. 19—Price reductions averaging about $500 on its trucks and tractors have been announced by the H. J. Koehler Motors Corp. The prices follow:

	New Price	Old Price
Model D 1½-ton	$1885	$2285
Model M 2½-ton	2875	3365
Model MCS 2½-ton	2975	3450
Model F 3½-ton	3985	4450
Model MT 5-ton road tractor	2975	3450

KING CAR PRICES LOWER

Detroit, Aug. 19—The King Motor Car Co. has made substantial reductions in its prices. The list follows:

	New Price	Old Price
4 and 6-pass touring	$2225	$2725
Roadster	2140	2740
Coupe	3125	.....
Sedan	3235	4035

DURANT IN PRODUCTION SEPT. 1

Muncie, Ind., Aug. 23—The Durant Motor Corp. of Indiana will be in production of the Durant car at the factories here by Sept. 1. Facilities are available for the construction of 25,000 cars annually and this can be extended, if required.

Community Camps Pay Big Returns On Investments

Spokane Claims to Collect $5,000 Daily from Tourists Using Accommodations

SPOKANE, Aug. 20—Communities considering the establishment of free motor tourists' camps will be interested in Spokane's experience. It is claimed the city reaps a harvest of not less than $5,000 daily from motor tourist travel. The community maintains a fine camp with many conveniences, and in August the average has been more than 100 cars daily. A larger number of cars than this use the hotel service which is adequate and moderate in price. A survey of the camp elicited the conclusion that the city gets a minimum of $10 from each tourist car. Typical statements on the subject were:

"We'll leave about $100 in Spokane after a two-day visit," said W. H. Wiseman, San Francisco, heading a party of four. "We've spent $70 already, and the women are going shopping again, so you better tack a few more dollars on that $100 ante."

Some expense items mentioned by Mr. Wiseman were: gasoline, $11.80; a tire, $43; provisions, $14; laundry, $3; natatorium park and theaters, $6.

Other expenses were similar.

N. O. S. AFTER MEMBERSHIPS

Charlotte, N. C., Aug. 19—The Charlotte Automotive Trades Assn. has declined to endorse the proposal of a representative of the National Organization Service for the formation of a car owners' association here. The directors announced, however, that they would welcome an association of car owners which would be affiliated with the American Automobile Assn. Cost, and the methods of distributing membership dues between the local and national associations were objectionable features, in the view of the local association in refusing to affiliate with the organization.

CHICAGO SALES NOT SO BRISK

Chicago, Aug. 24—Sales for August in Chicago and controlled territory are not as brisk as they were through July. There has been a decided falling-off in actual sales and inquiries. July business was unusually good, so that with the noticeable drop in sales, business may still be said to be satisfactory. August this year compares favorably with the same month of last year.

The one bright spot as pointed out by Chicago distributors is the strong upward trend of rural business. Country dealers are finding more business than for many months and prospects indicate fall business will be very satisfactory.

Trucks are not moving, excepting light vehicles. Tires are maintaining an active market and accessories sales are increasing.

General Motors' Profits Mount in Second Quarter

Refunds to Purchasers Reduce Amount by Over $4,000,000; Credit Lower Prices

NEW YORK, Aug. 23—Net profits of the General Motors Corp. for the second quarter of 1921 were $12,533,909 as compared with $1,675,492 for the first quarter, indicating the remarkable increase in business which followed the first three months. Total profits for the first half were $14,209,402, but this amount is cut to $9,659,531 by a reduction of $4,549,870 to take care of refunds given purchasers of automobiles under guarantees against price declines. The amount reserved for this refund shows the effect of lower prices on sales.

The statement of earnings and a consolidated balance sheet, filed with the New York Stock Exchange, was accompanied by a letter from Pierre S. du Pont, president of the corporation, in which he told of the progress made in reduction of inventories and current liabilities.

Inventories, which amount to $222,098,805 in October, have been reduced to $147,502,086. Of this reduction, however, $25,776,112 was accomplished by the writing down of inventories.

During the same period of depression accounts payable, which had reached $40,736,127, have been reduced to $19,852,581, and notes payable from $87,596,076 to $68,808,250. In his letter, President du Pont says:

"The readjustment of financial affairs has been coupled with like improvement in the manufacturing part of the business. All factories have improved the quality and design of cars so that the General Motors line is quite abreast with or in advance of the best construction practices of the day. The company is unique in its ownership of factories for the making of parts and accessories necessary for quality production at lowest price. Each part may be fitted exactly in workmanship, thus giving to General Motors cars a distinct advantage not enjoyed by cars built up of parts assembled from numerous uncontrolled factories.

"General Motors Corp. maintains a research laboratory that is without equal in the motor world. Here every part and assembly of parts is subjected to most rigid test and criticism, so that General Motors products, even when newly introduced, have been subject to practical proof. In this laboratory many new devices are being tested and much experimental work is being done toward maintenance of General Motors quality."

The income and surplus account for the six months ended June 30 will be found in the accompanying table.

The consolidated balance sheet shows current and working assets of $234,179,805, including $49,363,653 in cash, $5,547,867 in sight drafts against bills of lading, $9,133,387 in notes receivable, $21,042,606 in accounts receivable and trade acceptances and $147,502,086 in inventories.

Current liabilities amount to $110,060,804, including $19,852,581 in accounts payable and trade acceptances, $68,808,250 in notes payable, and $20,381,334 in taxes, payrolls and sundries accrued but not due.

GOODYEAR MAKING 7,000 TIRES

Akron, Aug. 23—President Wilmer of the Goodyear Tire & Rubber Co., has announced that 900 men will be laid off, but that the reduction in the factory force is expected to mean only a slight curtailment of production because of the steadily increasing individual efficiency of factory operatives. Goodyear has been averaging 2,500 tires a day for the last few weeks in the Akron plant and 3,500 tires in the California factory. No further reductions are contemplated for the remainder of this month.

GENERAL MOTORS' INCOME AND SURPLUS ACCOUNT, 1921

	1st Quarter.	2d Quarter.	Ttl. 6 Mos.
Net earnings	$3,707,944.49	$14,551,516.41	$18,259,460.90
Less: Provision for employees' investment fund	510,605.00	580,455.00	1,091,060.00
Interest on notes and trade acceptances	1,501,215.60	1,426,109.62	2,927,325.22
Employees' housing development	2,500.00	300.00	2,200.00
	$2,014,320.60	$2,006,264.62	$4,020,585.22
	$1,693,623.89	$12,545,251.79	$14,238,875.68
Less: Provision for federal taxes and extraordinary expenditures	18,131.26	11,341.89	29,473.15
Balance equals net profits before deducting refunds made to customers under agreement of October, 1920, which agreement guaranteed customers against price reductions before July 1, 1921	1,675,492.63	12,533,909.90	14,209,402.53
Deduct total liability incurred under aforesaid agreement on account of 1921 sales due to price reductions made previous to July 1, 1921			$ 4,549,870.99
Balance			9,659,531.54
General Motors proportion thereof			9,605,675.60
Surplus, Dec. 31, 1920			121,273,217.00
			$130,878,892.60
Less: Preferred and debenture stock dividends, 6 months			3,137,125.43
Common stock dividends, 6 months			10,230,975.25
			13,368,100.68
Surplus, June 30, 1921			$117,510,791.92

Used Car Clearing House Gives Results in Atlanta

Weekly Report Made to All Members of Automobile Trades Assn.; Information Complete

ATLANTA, Aug. 20—The Atlanta Automobile Assn. has organized a used car sales report which is accomplishing good results as a clearing house, and which costs little to operate.

Each week a report of virtually all used cars sold in Atlanta is made to every member of the association who is cooperating in the plan.

The report includes information concerning the make of the car, model, year, type, passenger capacity, cylinders, horsepower, list price when new, price at which car is sold, and price of repairs, painting, etc. By means of this service the dealer is kept in touch with market prices, and is aided in setting his own on used cars.

The Atlanta association furnishes this report only to those members each week who promptly report their used car sales on the special blanks sent them by Secretary W. B. Fitzgerald for that purpose. Any dealer who does not make his individual report does not receive the sales report from the association. The number of the members represented by the combined report of sales is listed, but not the names of the dealers who made the sales.

CELEBRATE DIXIE HIGHWAY OPENING

Chicago, Aug. 19—The opening of the Illinois section of the Dixie Highway from Danville to Chicago, a distance of 146 miles, was celebrated Aug. 12, when the nucleus of a parade, starting at Danville and gathering new members at almost every cross roads, started the trip for Chicago. Each town along the route sent its most beautiful girl to grace the parade when it should make its entry into Chicago. Prominent state officials delivered addresses from the reviewing stand. Illinois is the first state to complete its quota of Dixie highway.

NEW TRADE BODY IN WASHINGTON

Seattle, Aug. 20—The consolidation of the Washington State Automobile Chamber of Commerce and the Automotive Trades Assn. into a state-wide organization to be known as the Washington Automotive Trades Assn. was recently effected.

L. E. Titus, Centralia, president of the state dealers' association, was elected president of the new organization. J. H. McDiarmid, Seattle, president of the Automotive Trades Assn., was elected vice-president from the west side; W. F. McKenzie, Spokane, vice-president from the east side, and J. A. Snoddy, secretary of the Seattle Motor Car Dealers' Assn., state secretary.

Ver Linden's Answer Raises Claim Against G M C $220,000

Amount Includes Back Salary of $100,000 for 1921; Remainder Is Earnings on Bonus

DETROIT, Aug. 19—The answer of Edward Ver Linden to the suit for recovery of $490,000 brought by General Motors Corp., as filed in United States district court here, consists of a complete rebuttal of the claims of the corporation, and announces that he will claim the sum of $709,037.33 by way of recoupment. The case will be moved for trial when court convenes, but is likely to be long delayed owing to the heavy calendar of cases preceding it.

In setting forth his claims, Ver Linden amplifies the statement made by his counsel, Thomas, Shields & Silsbee, following the first filing of the suit by General Motors. The terms of his contract made under the Durant regime on Aug. 1, 1918, are set forth in the answer, showing that he was to receive $100,000 a year salary and a percentage on earnings in excess of $2,000,000.

Outstanding features in the contract quoted are:

On earnings up to $5,000,000, the general manager to receive 5 per cent.

Earnings from $5,000,000 to $10,000,000, the general manager to receive 3 per cent.

One Per Cent on 20 Million Dollars

Earnings $10,000,000 to $20,000,000, the general manager to receive 1 per cent.

In case corporation earnings exceed or fall short of 30 per cent on the total capital invested, exclusive of good will, 2 per cent is to be added or deducted for each 1 per cent of excess or deficiency.

Among other deductions or allowances from gross earnings shall be all necessary or proper reserves for losses, bad debts, insurance and other contingencies, suitable amounts for depreciation, besides all taxes, state, federal or local, including federal income and capital stock taxes, but excluding federal war profits taxes and excess profits taxes.

Net earnings of division to be modified by rate of net earnings of the corporation.

One-third of the percentage earned at the end of the first year to be paid one-third in corporation's bonus stock, and in succeeding years, two-thirds to be paid in bonus stock.

The aim of this form of compensation is to effect a large and continuing investment in General Motors stock by general managers.

Stock forfeiture clauses in the event of discharge or voluntary leaving were waived, the answer declares.

Money declared retained by the company to pay for bonus stock is as follows: 1918, $108,080; 1919, $234,230. Claim is made to $166,727.33 as due for 1920 on basis of contract. An interest demand of $2,916.66 on balance of 1918 salary held for two years is also made. To this is added $100,000 as salary due for 1921, as per contract, and $100,000 is added for probable share of earnings in 1921. Leave is asked to plead for such money as represents percentage on profit of Olds for 1921 when such can be ascertained.

The check drawn by Ver Linden as president of Olds Motor Works is declared to have been in accordance with the usual procedure; reports were made, and customary and proper records entered on the books and the amount is declared to represent money owed Ver Linden after deducting $66,430.49 charged against him on the corporation's books.

It is further declared that Ver Linden will make payment to the corporation on delivery of stock now held by it, and that such payment would have been made earlier but that the corporation has neglected and declined to deliver the stock.

Guides Will Lead You to Post Office

CINCINNATI, Aug. 23 — Through the efforts of the Cincinnati Motor Club, backed by the influence of the Ohio Automobile Ass'n, the names of towns, not classed as large cities, will be displayed on signs outside of post offices. This practice, which came about through appeal to Postmaster General Hayes, will mean that more than 60,000 signs will be placed in towns and villages throughout the United States.

CADILLAC ADDS TO FORCE

Detroit, Aug. 19—Cadillac Motor Car Co. is increasing its working force to meet increased demand for its product from larger cities of the country. About 1,000 men will be added, factory officials declare, bringing production up to 65 cars a day, or 75 per cent of normal output. New business is reported to be running about even as regards enclosed or open models, with the enclosed car a slight favorite. Though the principal source of the new business is from leading industrial centers, the company declares improvement is becoming general.

New Group Plan in Georgia Lowers Dealers' Insurance

State Association Expects to Expand Idea Until It Includes Theft and Fire Risks

ATLANTA, Aug. 20—The Georgia Automotive Dealers' Assn. has accepted a group plan covering liability and property damage insurance that will save from 35 to 60 per cent of the old cost of such insurance to every member of the association in the state. The plan for the present includes only the two forms of insurance mentioned but later it is expected to add fire and theft indemnity at a cost equally low.

The details of the plan adopted are comparatively simple, nothing more being required than that the insured be a member of the Georgia Automotive Dealers' Assn. in good standing. Each dealer will receive his own individual policy which differs in no respect from any other insurance policy, save that through the combined payroll of the members the premium is very materially reduced. This, of course, is the primary advantage of the plan.

P. A. Megahee, secretary of the association, has sent a questionnaire to every member of the body in the state covering the important phases of the plan, and replies received indicate that virtually every member of the organization will ultimately carry this insurance and no other form. The result will be a saving of many thousands of dollars to the automotive dealers of Georgia, amounting in each individual instance to many times more than the cost of association membership.

REO TO BUILD 12,000 TRUCKS

Lansing, Mich., Aug. 24—Olds Motor Works has outlined a production of 12,000 annually of its new 1-ton Economy truck. Increased sales possibilities have been opened by the remodelling of the truck to 1-ton capacity, officials declare, and business is on the upward trend. Car sales are moving at the rate of 70 to 80 daily, holding to the June and July production figure.

Carload Shipments Show Decrease

NEW YORK, Aug. 20—Reports made to the National Automobile Chamber of Commerce show that July shipments of cars and trucks by its members were 61 per cent of those of July, 1920, and 7 per cent less than for June of this year. Last year's July shipments were 4 per cent less than June's. Shipment figures by months thus far this year are:

	Carloads		Driveaways		Boat	
	1920	1921	1920	1921	1920	1921
January	25,057	6,485	29,283	3,185	.....	93
February	25,505	9,986	43,719	7,507	.....	99
March	29,326	16,287	57,273	9,939	.....	75
April	17,147	20,187	64,634	14,197	.....	1,619
May	21,977	18,608	74,286	15,193	.....	2,381
June	22,516	20,269	60,746	18,834	8,350	3,947
July	23,082	19,470	52,342	15,320	8,702	3,725

Pirate Dealers Offering Bargains in California

Sell 28 Trucks Worth $69,000 to Wrecker for $28,000; Orphan Cars Plentiful

LOS ANGELES, Aug. 20—July showed a loss over June of almost 1,000 in the number of new car registrations in southern California. The total for the month was 4,290, while June reported 5,223, according to figures that have just been made public. As an indication of conditions in the outlying territory, 3,078 of the new cars registered were from Los Angeles county.

There are 10 counties in what is known as southern California. The number of trucks and commercial cars registered during the month was 405. The totals to Aug. 1 for the year are 24,788 passenger vehicles and 3,251 commercial vehicles.

Southern California has been known all year as the best motor vehicle market in the country, and local dealers have been warned against a probable attempt to load this section to a point beyond which it can consume. Many carloads of cars and trucks have been shipped in here without there being any dealer representation for them.

The warehouses are well stocked and already bargain sales are going on. Twenty-eight trucks of one make, having an invoice price of $69,000, have been offered for $28,000 to a "wrecker" who makes a business of wrecking antiquated equipment for the parts. Three makes of passenger cars that are out of production are represented with a large supply at this point. Imported army trucks are available in quantities. An orgy of price cutting on this class of vehicles will be bound to have its effect on the legitimate dealers' business.

VACATION TIME SALES INCREASE

Sacramento, Aug. 22—Harvest conditions that have more than fulfilled expectations, together with a lessening in the financial stringency, have served to stimulate automobile sales in northern California. The fall business is proving better even than that of last spring, due to these facts, and also to the belief that no more price reductions may be expected soon.

The reduction of 2 cents in the price of gasoline also has not been without its good effect. Prospects who have been wavering are of the opinion that upkeep costs will continue to decrease, and orders are coming along in good shape, with just enough competition to keep a healthy tone in the business.

The touring season has been the very best the greatest of touring states has known. All of the hundreds of parks and beauty spots have been crowded during the summer months, and the approach of fall so far has brought no appreciable decrease.

In this connection, it is interesting to note the change of habits brought by the advent of the motor car. In former years the small cars would labor beneath their burden of camp equipment, while the higher priced automobiles would carry their owners to hotels. That is all changed now. The most expensive cars carry their blankets, tents, tables and cooking utensils, and the tourists camp out when night falls.

This camp life movement accounts not in any small measure for the big increase in the vacation time automobile sales this year.

$40,000 in Prizes to Tempt Speed Kings at Uniontown

Uniontown, Pa., Aug. 22—Several world-famous motor car drivers will compete on the Speedway here on Labor Day for the 225-mile classic. The Speedway purse for this event is $100 per mile, the amount being $22,500.

In addition to the Speedway purse will be the accessory prizes, bringing the total amount for distribution among the winners to approximately $40,000.

PIERCE-ARROW LOWERS PRICE

Buffalo, Aug. 21—Following is a price reduction schedule on Pierce-Arrow passenger cars, effective Sept. 1:

	New Price	Old Price
Touring cars	$6,500	$7,500
Roadster	7,000	8,000
Coupe, 3-pass	8,000	(new)
Coupe-sedan, 4-pass	8,000	8,500
Town brougham	8,000	8,500
Sedan, 4-door, 4-pass	8,250	(new)
French limousine	8,250	(new)
Limousine, 7-pass	8,250	8,750
Landaulet	8,500	9,000
Sedan, 6-pass	8,500	9,000

TRAYLOR TRUCKS REDUCED

Cornwells Heights, Pa., Aug. 20—Lower prices for all models of its trucks have been put into effect by the Traylor Engineering & Mfg. Co. The prices follow:

Model.	Old Price.	New Price.
B—1½-ton	$2,500	$2,390
C—2- ton	3,000	2,850
D—3- ton	3,500	3,300
E—4- ton	4,700	4,450
F—5- ton	5,100	5,100

G. M. C. REDUCES TRUCK PRICES

Pontiac, Mich., Aug. 23—General Motors Truck Co. announces price reductions, effective Aug. 17, on all its models. The largest reduction reduction is on the one-ton. The prices follow:

Model	New Price	Old Price
K16 1-ton	$1495	$1995
K41 2-ton	3000	3250
K71 3½-ton	4250	4500
K101 5-ton	4650	5100

MAY DISQUALIFY GUYOT

Paris, Aug. 23—In issuing the officially accepted times for the French Grand Prix race, the contest board reserves its decision regarding Albert Guyot's Duesenberg, placed sixth. On bursting a tire, Guyot slipped into soft ground, and the claim is made that spectators helped to push him out.

Texas Dealers Set Strong Pace in Automobile Sales

Dealers Get Neighbors of Buyers to Go On Notes; Cooperation Is Governing Spirit

Continued from page 21

One of the things the dealers generally have done is to eliminate the salesman who "sold a car occasionally" and to employ only the men who can and do "deliver the goods" all the time. They are making salesmanship a profession rather than a side line, and they say sales are increasing from the use of that one plan. Another thing is that when a salesman works up a sale and some office man closes it or delivers the car or truck, the salesman is given the credit.

The majority of the retailers are specializing; that is, they are pushing one particular style of car, saying that the sale of this established product increases the sale of other styles of the same make.

Again, the retailers maintain a service station where the owners' interests are carefully looked after. Usually this is done for a certain length of time without charge to the owner.

The retailers are working in harmony. They say if they cannot sell a man their car they will break the ground for some other dealer to sell one, and thus insure the customer or prospect a car of some kind. This is the first time there has been such cooperation among dealers in Dallas and north Texas.

Truck dealers are finding every one wants a truck. But they also find not every one is able to pay for them. Like the automobile dealers, they cannot trade their "truck paper" to the factory for more trucks and they must get paper that is negotiable at the bank. They do it in a peculiar manner and one which is satisfactory to every one concerned.

When they find a man wants a truck and is really able to own it but has not all the cash to pay for it at the time, they learn of conditions through influential and well-fixed neighbors. They ask these neighbors if they would be willing to go on the prospect's notes if he bought a truck. Nine times out of ten they are more than willing. With that arranged, they approach the prospect. They overcome his plea of lack of finances on the spot, close the deal, get the notes, deliver the car, collect on the notes at the bank and continue business with everyone satisfied. So far there has been no reduction in wages of employees at the various automobile houses, but these will likely come later in the year or the first of the coming year.

STARTS AUTOMOTIVE LIVERY

Toledo, Aug. 24—An automotive livery establishment—the first of its kind in Ohio—has been opened in Toledo by the Rentcar Co. The plan is simple. Any responsible person with references may rent a car, drive it himself, and be covered amply by insurance. Charges are based upon mileage driven and time the car is held.

Buckeye Owners Slow to Respond to New Title Law

Sworn Statement of Ownership Required With Each Registration for License Tags

TOLEDO, Aug. 24—Ohio automotive dealers are beginning to feel the effects of the new anti-theft registration system which is to go into effect in Ohio on August 15. Every motor car owner in the state is required to register his car with the county clerk and carry a complete description with him at all times. The bill of sale is a feature of the system which is aggravating to dealers.

The officials of the Ohio Automotive Trades Assn., who vigorously opposed the measure when it was before the legislature last winter, are already laying plans to revise the law so that a triplicate made at the time of registration for licenses may serve the same purpose as the much involved registration now does.

The present forms make it almost necessary for each dealer in used cars to keep one man at the courthouse tracing the records of cars he handles.

The owners have to have a sworn statement prepared with their registration. In case they sell a car the title will have to be traced through the records much as a parcel of real estate's record is now searched by abstractors. All such work costs the average man considerable money and is that much hindrance to motor car sales, the dealers point out.

Toledoans have been slow in signing up their papers. There are estimated to be more than 42,000 motorists in the city and only 6,400 had been registered by the middle of the week. It would take about 3,000 a day to make the total registration by the time limit—August 15. The highest day's registration has been 659. After the limit expires there is a fine of $25 for failure to register.

TRADE BUYING SOLID TRUCK TIRES

Akron, Aug. 20—The Mason Tire & Rubber Co., of Kent, near Akron, has increased its production from 1,800 to 2,000 tires daily and is now operating on a basis of 24 hours a day, according to announcement of D. M. Mason, general manager.

In units, Mason sales are running four to one over the same month of last year, while the month of July showed an increase of 50 per cent over July of last year.

OREGON TRACTOR TOUR SUCCESS

Seattle, Aug. 20—After a tour lasting more than a month and reaching farmers in every farming community in the western part of the state, the Ford tractor cavaran has returned to Seattle, the starting point. Lieut. Gov. W. J. Coyle, who was in charge of the caravan, and local Ford dealers declare that the caravan was eminently successful.

The caravan demonstration traveled 908 miles. In addition to its own traction journey, it covered 107 miles by barge. The caravan visited forty-eight towns, gave twenty-two demonstrations, and pulled 400 stumps. The demonstrations were witnessed by 20,000 persons and an additional 55,000 persons heard sales talks and lectures on general farm and land clearing and handling subjects.

Ford tractor dealers report that the caravan demonstrations have resulted in substantial increases in their sales.

DEFINES "PUBLIC GARAGE"

Chicago, Aug. 24—The Chicago Garage Owners' Assn., without having taken any official action to date, is strongly supporting the state fire marshal's broad interpretation of the new state law which seeks to define what shall constitute a public garage. The state law says that any storage place housing more than four cars shall come under the law and its provisions, which classification means that they will get fire inspection service. The state fire marshal goes farther and includes in his round of inspection every garage regardless of the number of cars it may house.

The Garage Owners' Assn. asserts that many privately owned cars are sheltered in mere shacks. Hundreds of other cars are parked at night on the streets of Chicago, inviting thieves and raising rates. Some action on the part of the association is expected to result from its objection to this practice.

In the Retail Field

Spokane—In evidence of the fact that the automobile industry in Spokane is not altogether marking time, the case of the recent midsummer sale by the Mitchell, Lewis & Staver Co. is worth scrutiny. In a two weeks' drive the firm sold and delivered 37 cars, took in 14 cars and resold 11 of these.

Quincy, Ill.—Automobile dealers here are to take full advantage of improving business conditions and will stage an automobile show during the Adams county fair. The show will be under the auspicies of the Quincy Automobile Trades Ass'n.

Woodlawn Motor Sales Co., Chicago, has added the Scripps-Booth cars to its line of cars.

Stephens Corp., Chicago, has contracted to add the Kink-8 to its line of Scripps-Booth cars.

California Stutz Co. is the firm name of the new Stutz agency in San Francisco.

Marmon Sales Co. has acquired the franchise for the Marmon car in Lexington, Ky., and surrounding territory. N. C. Kelley is head of the new agency.

Pacific Nash Motor Co. has effected changes in its Fresno and Oakland branches. In Fresno, Roy K. Dorr, who for the past year has served as manager, has acquired with Charles Tate, formerly manager of the Oakland branch, a half interest in the business.

Stockholders Victors in Standard Parts Co. Battle

Court Refuses Creditors Possession of Property and Allows Receivership to Stand

CLEVELAND, Aug. 23—Stockholders of the Standard Parts Co., which has been in the hands of receivers nearly a year, won a victory when Federal Judge D. C. Westenhaver ordered that the receivership be continued. Creditors of the company have petitioned the court for an order to sell the corporation's assets at once.

Under the creditors' plan, they would buy in the plants, form a new company to operate them, and the stockholders of the present corporation would be given the privilege of subscribing for a limited amount of stock in the new concern. The creditors would retain control of the new corporation.

The court also granted the request of the receiver, Frank Scott, for permission to pay a 10 per cent dividend to creditors. Approximately $1,000,000 will be paid out under this order. The company will have $500,000 in the treasury after the dividend is paid.

Plant Being Operated Economically

Judge Westenhaver declared that the actual physical value of the Standard Parts Co. is between $17,000,000 and $19,000,000, as compared to the $12,000,000 to $13,000,000 value fixed by the creditors. Commenting on the earnings of the company, the court expressed the opinion that operating losses during the entire receivership have been less than $60,000.

He said he believed the plant was being operated economically and that to turn the properties over to the creditors would be inequitable. The court further said that probably none of the plants could be sold at this time and that if opportunities developed in the meantime, the properties could be disposed of as efficiently through the receiver as under the creditors' control.

The company, under the receivership, has made money in recent months. Business this month is better than the average August business, and the management expects even better business during the fall months.

INDUSTRY GROWS IN SPOKANE

Spokane, Aug. 20—Spokane's automotive industry shows great gains since 1915. Today there are 81 automobile agencies, 14 truck agencies, and in close association with these salesrooms there are several battery stations, five automobile blacksmithing stations, several automobile cushion, electrical and fender repairshops, 16 automobile paintshops, 29 automobile repairshops, not including the shops located in every automobile agency, three spring repairshops, 17 tire repairshops, 30 branch tire sales headquarters and several automobile trimmer, trailer, body factories and specialists' shops.

Hoosier Dealers Grumble While Selling Automobiles

August Sales Equal July and in a General Way Business Seems to Be Good

INDIANAPOLIS, Aug. 21—In spite of the fact that there appears to be much grumbling over business, automobile dealers here are making sales with a regularity that promises to put August sales in such shape that they will compare favorably with July sales. Some dealers believe that August will not be as good a month as July because of the fact that it is the big vacation month. Dealers in the high priced cars report business during the first three weeks just about even with the first three weeks of July, with probably a very slight decrease. The dealers in the cheaper priced cars have about the same report with the exception that some of them are doing more business than they did during the same period last month. Some dealers expect to make gains.

The tire business continues very good, with gains being reported in virtually all makes. The good weather has caused much wear on tires, to which is attributed the increase in sales. Cords appear to be more popular than fabrics for those cars that ordinarily use fabric tires.

At the various automobile plants there is little pessimism shown. The plants appear to have arrived at a production basis that will enable them to keep their organizations, as re-organized, at work full time and the decreases in price have aided in speeding up production. While some of the reductions have only been announced for a short time, others have been in effect for a comparatively long period and at these plants, like the Lafayette, the Marmon and others, it is being proven that the reduction has offered a permanent increase instead of a temporary increase in sales. The Lafayette plant is behind with orders at the present time.

FORDSONS INVADE INDUSTRY

Chicago, Aug. 22—Large city distributors of Ford cars who have been compelled by the company to accept shipments of Fordson tractors in order to get the automobiles, have evolved the plan of fitting the tractors with rubber tires and other special equipment with the idea of promoting their use on docks, in warehouses and for other industrial purposes. Considerable work also has been done in adapting the machines for snow removal and other municipal work.

NASH SALES EXCEED OUTPUT

Kenosha, Aug. 20—The Nash Motors Co. reports that the demand for its cars following the price reductions last month exceeded production by more than 50 per cent, notwithstanding a considerable increase in the production schedule. Indications are that the heavy demand for cars will continue well in September. Dealers' stocks generally are depleted and orders are being booked for future delivery. The demand for cars is divided almost equally between four and six-cylinder models. Sales thus far in August have been fully as brisk as in July when Nash production was 2,470 automobiles.

A. E. A. Fires Opening Gun in New Accessory Sales Drive

Chicago, Aug. 20—Details of the merchandising plan of the Automotive Equipment Assn., which was authorized at the Mackinac Island convention, were made public for the first time last evening at a meeting of the Association of Automotive Equipment Manufacturers by Ray W. Sherman, who recently left the Class Journal Co. to become the merchandising director of the A. E. A. The organization which heard the story last evening is made up of equipment manufacturers in the Chicago district, most of whom belong to the A. E. A. The manufacturers expressed their approval of the plan and gave assurances of their support for the work.

As a first step in the plan the association expects to enlist the assistance of the jobbing salesmen, many of whom have already won the approval of dealers by efforts to show how business profits may be increased without much increase in operating cost by installing automotive equipment departments. That the merchandising plan may be presented to the largest number of dealers in the shortest time a book on the subject is being prepared and will be ready for distribution this fall. The entire industry will lend its assistance to the distribution. Briefly described, the book will tell how to add to business profits by equipment sales and will tell how to sell.

Many meetings of jobbing organizations and also of dealers are planned. Friday evening, Aug. 26, a jobbing meeting in Montreal will be addressed by Sherman and a similar affair will be held in Toronto the following day. The first presentation of the story to the trade was Wednesday evening to the Chicago Garage Owners' Assn., many of whose members have been handling equipment for some time.

The automotive equipment week, Aug. 6-13, proved successful, and other national campaigns for the furtherance of business are planned.

TEXAS CONDITIONS PROMISING

Houston, Aug. 22—While conditions in southern Texas still are bad, the outlook for general business for the next year is reasonably encouraging. Prospects indicate that it will be slow for the next six months, but that after that there will be a marked improvement which will carry it rapidly towards normal. Few of the farmers in this section will have funds to purchase automobiles or tractors when they have finished paying off their indebtedness this fall, but with the harvesting of another crop they will be back in the market for automotive equipment.

Horse-Drawn Traffic Less Than 4 Per Cent in Oregon

Three-Day Survey Made by Highway Department Shows Automotive Vehicles Far in Lead

PORTLAND, Ore., Aug. 19—Approximately 72 per cent of the vehicle traffic in the state of Oregon is by means of Oregon registered passenger automobiles, according to a report prepared this week by the Oregon state highway department, following a state-wide survey covering three days.

Approximately 14 per cent of the vehicles passing given points where the survey was made on each of three days were passenger automobiles of other states; 1.2 per cent were motorcycles; 4.6 per cent were light duty trucks; 3.2 per cent were trucks of 1½-ton or more capacity, and less than 4 per cent were horse-drawn vehicles.

Selecting 34 representative points on the leading highways throughout the state the deputies, under the state highway department, took the count on each of three consecutive days. The points were so arranged that it would be unlikely that any one vehicle would be counted more than once on any day. All the points were just outside the various cities and on the main traveled state roads, so as to indicate the cross-country and inter-city traffic and not to include any of the city traffic itself.

The report showed that there passed the given points during each of the three days on the average of 1,541 horse-drawn vehicles, 288 motorcycles, 29,949 passenger automobiles bearing Oregon licenses, 5,964 automobiles from other states, 1,870 light duty trucks, and 1,314 trucks of 1½-ton or more capacity. The report shows the tremendous growth of country travel by automobile. A goodly proportion of the passenger cars, including practically all of those from other states, were in the hands of motor tourists and motor campers, the report said, although no effort was made to keep a separate check on vehicles so used.

GASOLINE OFF 30 PER CENT

New York, Aug. 23—Wholesale gasoline prices in 30 leading cities of the United States average 20.3 cents a gallon as compared with an average price of 28.9 cents on Jan. 1, a decline of approximately 30 per cent. The lowest quotation given is 15 cents a gallon in Kansas City, Mo., while the largest decline in price since the first of the year has been in Dallas, Tex., where the cut has amounted to 42 per cent. Price declines in the Pacific coast states have been very slight since Jan. 1.

FRANKLIN DEALERS INSPECT CARS

Syracuse, Aug. 19—The 538 dealers of the Franklin Automobile Co., under instructions from the company, have started to give free monthly inspection of all Franklin cars in their respective territories.

Bay State Lens Law Brings Grief to Tardy Thousands

Lack of New Equipment Also Adds to Difficulty in Meeting Requirements of Measure

BOSTON, Aug. 20—Massachusetts is now under the new headlight law with a scarcity of lenses to meet it, and thousands of motorists are trying to get what they want in the way of new lights. Many of them waited until the last minute, as they do in registering. And the makers of lenses have been working night and day to get goods here, but not enough were available. One lens man stated that if he had 10 carloads in Boston, dealers from all over the state, and from some of the other states, would be racing in to get their share, bidding against the Boston dealers, who are anxious to take the whole shipment.

It is a time of hustle for the accessory people, and some of the car dealers have taken a hand by selling bulbs and lenses, also doing a focus business. All over the state men are opening up focusing stations and charging from 50 cents up to take care of motorists' wants. General focussing costs an average of about $1.

Owners Not Having Much Satisfaction

A great number of motorists are trying to do their own focussing and place their lenses. The state motor vehicle department has had some cards printed giving directions for doing this work, but many owners are not having much satisfaction as they have bought the wrong size lens, or do not know how to put lenses in properly, with the result that it is not unusual to find on main traveled roads broken lenses every few hundred yards, or meet with cars whose lights are out of focus. It is doubtful if the law will be of much use for several weeks.

Meanwhile police chiefs of Massachusetts have all received letters with warning tags to place on cars not properly fitted with lenses. These warning tags will tell the owner he cannot operate his car at night until it meets the law's requirement, and that the number, if sent to the motor vehicle registrar's office, will be checked up. A second report for not being equipped will cause suspension of the license to drive, and perhaps the registration of the car. The owner, too, will be in jeopardy if he has an accident; for, not being lawfully equipped, the burden of blame would be on him.

Just what is going to happen to motorists from other states is a problem the police chiefs will have to face. According to the law, Massachusetts has legalized a number of devices, and standardized on 21 c.p. bulbs. Visiting motorists may take a chance, and if they are not equipped as the Bay State requires, may be let off with a warning. However, after a few weeks they may be brought into court. The motor department is not going to be drastic right away, but in a few weeks enforcement of the law will become general.

The truck owners using acetylene gas are safe; for this has been legalized with a 5/8 ft. burner and a 6-in. mirror. One thing that will be impressed upon truck owners, and also car owners who are careless, is that they must keep the reflectors or mirrors polished. Thousands of reflectors have been allowed to get rusty, and the glass in many vehicles once knocked out has never been replaced. The machines in that condition cannot be operated any more. There has been some trouble over the older Ford cars, too, and it has been ruled that owners can buy nitrogen bulbs that will meet their requirements.

Senate Eliminates Highway Commission From Road Bill

Continued from page 21

not been occasioned by the inquiry of Senator Pomerene as to the terms of the measure and his objection to a vote, until details could be given him. The Senate leader decided to rule adversely on the commission plan during the interim.

As a result of the debate, it was decided that 60 per cent of all Federal funds should be expended on three-sevenths of the total mileage of any state and the remaining 40 per cent be expended on the next 4 per cent of state roads, thus assuring interstate roads. This agreement is regarded as a forward step by the industry agents. The bill, when passed by the Senate, will go to conference, but will not become a law for several weeks as a result of the congressional recess.

The distinctive features of the Townsend bill as it passed the Senate are:

Recognition of the interstate highway principle; drastic provision for maintenance; formula for the highway in the public lands states, also liberal appropriation for roads and forest reservations—$5,000,000 for the first year and $10,000,000 the second; and more rigid standards of durability, the latter being one of the principles which the National Automobile Chamber of Commerce and the American Automobile Assn. have advocated over a period of years. The new act provides that roads must be constructed with regard to the future as well as prevailing needs.

Pyke Johnson, secretary of the highway committee of the N. A. C. C., said that a number of circumstances contributed to the defeat of the Federal Highway Commission, as proposed by the industry. He said that there has been a distinct feeling against the creation of new commissions and efforts of Senate leaders to enact legislation for this purpose have invariably failed of late.

Chicago—Twenty automobile and civics organizations have made representation to the Park Board to check automobile thefts in the great parking centers of the city. Three methods have been suggested: first, free checking by employees of the clubs; second, renting space in the parks and having the clubs' employees render free service, the proceeds from rentals to go to the park boards; and third, checking by city employees.

Indiana Automotive Assn. To Hold Secretary Forum

School for Training of Organization Heads Will Be Held in September; Program Arranged

INDIANAPOLIS, Aug. 22—A tentative program for a "Secretary Forum" for automotive trade association secretaries of Indiana has been announced by L. M. Shaw, secretary-manager of the Indiana Automotive Trade Assn. The program, with subjects assigned to secretaries of various organizations, has been sent out, with a questionnaire asking the secretary to notify the I. A. T. A. office of acceptance. Seven of the secretaries have already accepted and assured the I. A. T. A. of participation.

The purpose of the forum is to provide local secretaries throughout the state with first-hand information of the methods used by other secretaries in successfully carrying out certain operations. Each subject will be handled by a secretary who has had personal experience with a successful project. Harry G. Moock, general manager of the National Automobile Dealers' Assn., has been asked to take part and be present to observe the working of the plan. It is probable that if the forum is the success which is hoped for it, that it will be suggested to other state associations. The program as arranged now is dated for Sept. 20 and 21, and is as follows:

"Reasons for a Secretary Forum," President N. H. Cartinhour.

"The Secretary; What He Is and Means to An Automotive Trade Association," H. G. Moock, general manager National Automobile Dealers' Assn.

Questions and discussion.

"Selling the Association Idea to the Public," Clem McConaha, Wayne County Automobile Trade Assn.

"Popularizing the Association and Its Purposes," Hugh Perry, Howard County Automobile Trade Assn.

"An Automobile Show Building in a Small City and How to Get It," Karl B. Voelz, Columbus Automobile Trade Assn.

Questions and discussion.

"The Used Car and the Secretary's Place in Aiding in Solution and Working Out of This Problem."

"Setting Up a Used Car Plan," H. G. Moock, general manager N. A. D. A.

Questions and discussion.

"Selling Memberships in Local Associations," J. F. Frohbieter, Evansville Automobile Dealers' Club.

"Declaring Dividends On Association Investments," C. V. Bender, Muncie Automobile Trade Assn.

"Effectiveness of the Gentlemen's Agreement As Compared to Rules and Penalties," S. M. Van Cleave, Marion Automobile Trade Assn.

Questions and discussion.

"How to Bring Out Attendance"; "How to Make Committees Work"; "Selection of Committees"; "Making Up a Budget and Why."

Chicago Automotive Trade Ass'n, will give its seventeenth annual outing Aug. 31 to the orphans of the city, who number about 4,000. Each dealer in the city is requested to furnish one or more cars and ask their friends and customers to furnish the remainder of the 500 cars which are required to transport the youngsters on their annual joy ride. Refreshments and entertainment are furnished by the association.

Coming Conference Will Discuss Insurance Rates

Call for Meeting Indicates That Liability Companies May Be Ready to Change Practices

NEW YORK, Aug. 24—General revision of automobile liability rates will be discussed at a conference to be held in the near future by members of the National Workmen's Compensation Service Bureau. The call for the meeting states that there are indications that coverages and rates are not properly adapted to present conditions. In this connection A. W. Whitney, general manager of the bureau, says:

"It has been evident for some time to the automobile committee and to us in the bureau that this season should see a thorough overhauling of our automobiling rating system. There are many indications that our coverage and rates are not properly adapted to the present conditions in the automobile field. We are working on the problem in this office and have, for one thing, participated in a recent joint conference in Detroit between the bureau, the Fire Underwriters' Conference and a committee from the National Automobile Chamber of Commerce. This meeting, which was for the purpose of discussing fundamental matters of common interest, was of considerable importance in itself and it also paved the way for a relationship in the future which may do much to bring our practices into closer relationship with the needs of the business.

"We propose to start the work of the automobile committee about the middle of September with an intensive consideration of the general problem."

Mutual Companies Would Be Formed

The call for this conference and the statement by Whitney would indicate that the insurance companies are beginning to take seriously the threat made by automobile interests through the National Automobile Chamber of Commerce that unless radical changes are made in the present automobile insurance system mutual companies will be formed for the protection of manufacturers, dealers and car owners.

Reports from various sections of the country show that insurance companies are beginning to take into account the "moral hazard," which has been disregarded in the past.

TO OPEN CHAIN OF BRANCHES

New York, Aug. 23—Seven new assembling and distributing branches will be opened in the near future by the Martin Parry Corp. They will be located in Philadelphia, Cleveland, Pittsburgh, Detroit, St. Louis, Kansas City and Newark. The same number of branches now are in operation. The purpose of opening the new stations is to carry a complete line of commercial bodies, relieving dealers from the necessity of tying up money in body stocks and to satisfy growing demands for sectional bodies. The plant of the company at York, Pa., is running at capacity and the Indianapolis plant on a 50 per cent basis. Sales for the first six months of the year were about $2,300,000, equalling those of the same period of 1920.

Durant Holds 130,000 Shares in New Michigan Company

Detroit, Aug. 20—Incorporation papers for Durant Motors Corp. of Michigan have been filed at Lansing. The capitalization is $5,000,000 in common stock, with a par value of $10. W. C. Durant, vice president, holds 130,000 shares. The other incorporators are Edward Ver Linden, president and general manager; Edmund C. Shields, Lansing, secretary and treasurer; Carroll Downes and C. F. Daly, New York, all of whom hold 100 shares. Downes is connected with the Durant corporation, and formerly held a responsible position in a Philadelphia bank.

Work on the new plant at Lansing has progressed so rapidly that it is expected production of cars will begin by November. The Durant Four will be assembled in the meantime at the Long Island City plant.

Announcement is made at Durant headquarters that a complete line of six-cylinder automobiles, including five-passenger and seven-passenger touring cars, runabouts, coupes, sedans and limousines will be made by the Durant Motor Co. of Indiana, which has taken over the Sheridan plant of the General Motors Corp. The directors of the Indiana company are W. C. Durant, T. W. Warner and D. A. Burke.

ASK RECEIVERSHIP FOR MUTUAL

Indianapolis, Aug. 23—A petition has been filed at Sullivan, Ind., for the appointment of a receiver for the Mutual Truck Co., with a plant in that city. The petitioners are the Electric Steel Co., Indianapolis, and Sherman & Pomroy, Inc., advertising agents, Chicago. It is alleged that the company is insolvent and that it owes $85,000. The capital stock of the corporation is $500,000, and nearly all the stock is owned by residents of Sullivan county.

TREND TOWARD ENCLOSED BODIES

Detroit, Aug. 19—The Ternstedt Mfg. Co., through the acquisition of the England Mfg. Co. and the body hardware plants of the Fisher Body Co., is going into production on a scale which it is estimated will carry it at capacity for the balance of the year. The company has been operating at capacity for 60 days, and President Paul W. Seiler declares orders on hand will carry it at full speed indefinitely.

Eighty per cent of the present business is enclosed body business, and Seiler looks for an increased trade on this type of car as the season advances. There is a decided trend, he affirmed, toward the enclosed type of car for all-season use.

Bumper Crops in Central Illinois Assure Big Sales

Dealers' Organizations Have Been Active Through Dull Market; Ready for Harvest

BLOOMINGTON, Ill., Aug. 19—Central Illinois automobile dealers report the volume of business this summer well ahead of the same period a year ago, due in part to the increase in the number of cars available from the manufacturers, while there is a better tone to the financial situation. Industries which were suspended last summer and fall are reopened in most instances and, while many are working with a reduced force as compared to the war period, there is a gradual increase in forces which is reducing the number of men out of employment and increasing the money circulation.

With bumper crops, farmers are becoming more cheerful. Wheat has been up to expectations and the major portion has been converted into cash. The money in most instances has been utilized in paying old obligations and in buying machinery and other necessities deferred from a year ago.

The oats returns have been disappointing. However, the oats acreage is small compared with that of wheat and corn and the lack of profit in the former will not seriously affect the general situation.

Tractor Demonstrations Being Arranged

Timely rains have developed the corn crop wonderfully and the yield promises to be the best in years. With the harvesting of the latter cereal, the farmers will again be in a position to spend money and the men who handle tractors are preparing to interest them in a machine.

Tractor demonstrations are being arranged in many sections in Illinois, which fact is a healthy indication of a revival in power farming business. Three well-attended exhibitions of plowing with tractors were given in the opening weeks of August near Pekin, Cissna Park and Monmouth, and quite a number have been advertised for September.

Dealers in motor cars, trucks and tractors have been loyal to their local, state and national associations and this, too, has been a healthy sign. With most of the local associations, meetings have been held regularly throughout the spring and summer and subjects of importance to all discussed. Get-together events have been arranged, and in other ways efforts made to keep up interest in the organization and promote the individual and collective welfare. The central Illinois dealers enter upon the fall campaign full of energy and enthusiasm and look forward optimistically to a big gain in business over that of a year ago. Reports from the office of the secretary of state in Springfield show that approximately 100,000 more licenses for motor vehicles will be issued this year than in 1920.

Concerning Men You Know

H. J. Edwards has resigned as manager of the Elyria plant of the Willys-Overland Co., where all the engines for Willys-Knight cars have been made. Edwards is one of the pioneer designers of the automotive industry. He designed the Stoddard-Dayton car and when it was taken over by the United Motors Corp. went with that company. In 1911 he designed the Edwards-Knight engine and established a factory in New Jersey. His engine rights later were purchased by John N. Willys and the engine was used in the Willys-Knight car. Edwards has been with Willys continuously since that time.

W. R. McCulla has been appointed district manager of the Bijur Motor Appliance Co., with headquarters at Detroit. Mr. McCulla has a long record of experience in the engineering department of the Packard Motor Car Co. and the Willys-Overland Co.

Lon R. Smith, vice-president, directing sales and advertising, Midwest Engine Co., Indianapolis, has left on his annual business trip to California. Mr. Smith expects to remain in Los Angeles, San Francisco and throughout that territory for at least four weeks.

S. M. Williams, chairman of the Federal highway council says that he is not a candidate for membership in the proposed Federal highway commission provided for in the bill now before the Senate, and that he could not accept the appointment if it were offered him because he has assisted in the promotion of legislation for the creation of the commission.

George Stowe, former manager of the New York branch of the Mitchell Motors Co., has been appointed general manager of the Reo Motor Cor Co. of New York to succeed James J. Hunt. Stowe was New York manager for the Chalmers Motor Car Co., before going with Mitchell.

E. W. Seaholm has been appointed chief engineer of the Cadillac Motor Car Co., succeeding **B. H. Anibal,** who resigned to become chief engineer with the Collins Motor Car Co.

Fred W. Warner, former president and general manager of the Oakland division of General Motors, has been placed in charge of the sale of stock for Durant Motors Corp. of Michigan.

William H. Herbert has been appointed general sales manager of the Denby Motor Truck Co., succeeding L. B. Graham resigned. Mr. Herbert is one of the oldest menbers in point of service of the Denby organization, having served as special field representative, assistant sales manager, and manager of the Detroit branch.

Roy C. Schultz, assistant traffic manager of the B. F. Goodrich Co. of Akron died suddenly Aug. 10 following an operation. Schultz has been with the Goodrich Co. for 20 years, joining the company as an office boy at the age of 14. He was regarded as one of the best known men of the tire industry.

Fred W. Warner, former president and general manager of the Oakland Motor Car division of the General Motors Corp., has been placed in charge of the selling of stock for the Durant Motors Corp. of Michigan.

Frank B. Allen, formerly of the C. E. Fay-Allen Co., has formed a company to sell the Wills Sainte Claire car exclusively for New England. Fay has reorganized his company as the C. E. Fay Co. and will handle the Maxwell Chalmers line.

C. E. Vaughn, with headquarters in Chicago has been made assistant sales manager for middle and northwestern territories for the Klaxon Co., Newark, N. J.

Henry L. Ines, president of the American Motors Export Co., Jacksonville, Fla. died at home in Jacksonville, Aug. 16. He was formerly connected with Dodge Brothers, Chevrolet and the Parish-Bingham Corp.

A. W. L. Gilpin returns to Chicago as branch manager of the Ford Motor Co., succeeding Charles Hendly who becomes general manager of the Simplex Corp. Gilpin was formerly assistant manager of the Ford plant under Dayton Keith.

C. A. Brownell, former advertising manager for the Ford Motor Co., has returned from a long vacation in California and has assumed his position as vice president in charge of sales distribution and advertising of the Wildman Rubber Co., Bay City, Mich.

R. H. Scott, vice president of Reo Motor Co., has been reelected president of the Novo Engine Co., Lansing, Mich. Other officers are C. E. Bement, vice president and general manager, D. R. Headley, secretary, B. J. Bement, treasurer, and Eric P. Teel, general superintendent. These officers with D. E. Bates and H. C. Teel, comprise the directors.

W. G. Haskell, Jr., has been made general manager of the Johnson Gas Appliance Co., Cedar Rapids, to take the place of T. E. Rooke, resigned.

Leon R. German, former comptroller and vice president of the Olds Motor division of the General Motors Corp. has been appointed sales manager for Durant Motors Corp. of Michigan which is headed by Edward Ver Linden, former president and general manager of Olds. He will have charge of Durant sales in the territory between the Adriondacks and the Rocky mountains and will assume his duties Sept. 1.

Henry Knott, former advertising manager of the Waltham Watch Co. has joined forces with Frank T. Day, former Waltham sales manager, and under the firm name of Henry Knott, Inc., has established an advertising agency with headquarters in Boston.

Central Ohio Business Is Building Towards Normal

Columbus, O., Aug. 23—Continued improvement in passenger car business is reported by nearly all dealers and distributors in Columbus and central Ohio. Some recent reductions in prices have still further stimulated sales and it is believed there will be a continuous improvement from this time on.

Ford demand, which was stopped several weeks ago to a large extent by published reports that different models and lower prices would soon be announced, has recovered to a certain extent and the volume of business is going forward. Other lines are having a steady trade, with those selling between $900 and $3,000 in greatest demand.

Dealers and distributors generally in central Ohio territory are optimistic as to the future and preparations have been made for a good business during September and October. Rural dealers are reporting some increase in demand, but trade in farming sections is still slow, and there is little chance of immediate recovery.

Truck business is not improving to any extent. There is a fair demand for the light delivery wagons, but when it comes to heavier vehicles, the demand is lacking. Haulers are not working to any extent and are not renewing their equipment.

Milwaukee New Car Sales Slowed by Used Car Rush

Milwaukee, Aug. 22—Used cars have once more become a drug on the market in this territory, affecting adversely the movement of new cars, despite which, however, the volume of sales is being maintained at a satisfactory rate. New car purchases involve acceptance of used cars to perhaps a heavier degree than ever before, in addition to which a good many cars have been thrown on the market by owners who need ready cash or are trying to unload before the end of the real motoring season. In a general way, enclosed cars are moving best and more than one-half of purchasers are asking for coupe or sedan types. It is reported that Ford sales are just about holding their own in Milwaukee after making a steady advance for about 60 days.

The Wisconsin State Fair, Aug. 29 to Sept. 3, is expected by Milwaukee distributors to furnish a stimulant to dealers' orders, and dealers count upon this event, together with the season of county fairs now opening in this state, to enlarge upon their orders or requisition cars on old contracts. The demand from rural communities is expected to revive with the conversion of crops into cash, a process now in its beginning.

Five Years and $5,000 for Stealing Your Automobile

Washington, Aug. 22—Senator Brandegee, of Connecticut, reported from the Senate Committee on Judiciary today a bill amending the act of October 29, 1909, known as the "National Motor Vehicle Theft Act." The committee reported it favorably without amendment and undoubtedly it will be enacted at an early date.

The amendment provides that a heavy penalty shall be imposed against automobile thefts. As reported by the Judiciary Committee, the amendment reads as follows:

That whoever shall transport or cause to be transported in interstate or foreign commerce a motor vehicle with intent to, or in conspiracy to, defraud the owner or any insurer carrying insurance thereon against loss by any hazard shall be punished by a fine of not more than $5,000 or by imprisonment for not more than five years, or both. That whoever shall receive, conceal, store, barter, sell or dispose of any motor vehicle, moving as, or which is a part of, or which constitutes interstate commerce with intent to or in conspiracy to defraud the owner or any insurer carrying insurance thereon against loss by any hazard shall be punished by a fine of not more than $5,000 or by imprisonment of not more than five years, or both.

FALL AND SPRING HOLD PROMISE

Charlotte, N. C., Aug. 21—Automobile business next fall and spring in this section is expected to be practically double that of a year ago. It is not likely, however, that farmers who raise tobacco and cotton will be able to do much buying after they have liquidated their indebtedness. Indications are that country bankers will be very conservative in regard to handling automobile paper for the small town dealer. These bankers are loaded with notes given by farmers on the last year's crops which have not yet been sold, and there is very little money in smaller centers.

PIEDMONT LOWERS PRICE

Lynchburg, Va., Aug. 20—The Piedmont Motor Car Co. has decided to reduce the price of its 4-30 model from $1,270 to $970 and of its 6-40 model from $1,495 to $1,285.

Automotive Repair Shop
Practical Maintenance Hints

Old Pistons Used for Washer Punches

Thin washers, required in repair work to take out play and resultant rattle from parts of the running gear and to place under nuts to bring cotter pin holes in line, can be made with the aid of two old pistons modified as shown in the illustration. A slot is sawed at one of the bosses for the wrist pin, one of the wrist pins being used as a punch after grinding the end squarely sharp. The inside of the washer is cut with one size wrist pin while the outside is cut using a larger piston and wrist pin.

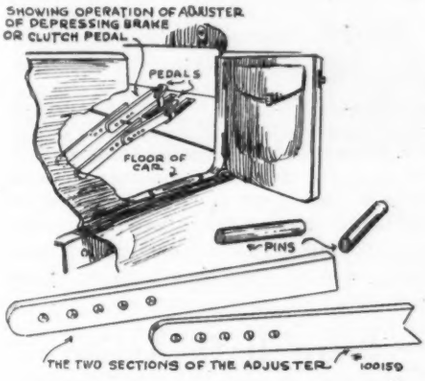
The wrist pin which cuts the outside circle is fitted with a plug or mandrel which centers in the inside diameter and makes an even washer. To seat the pistons on the bench, one side or what corresponds to the bottom of these improvised punches is faced flat on the grindstone. Though these pistons are fitted with brass bushings, they will cut quite a few washers without dragging the edges if a sharp quick blow is given to the wrist pin punch. Substituting steel bushings at the cutting face improves the punch and makes it last a much longer time.

Clutch and Brake Pedal for Repairshop

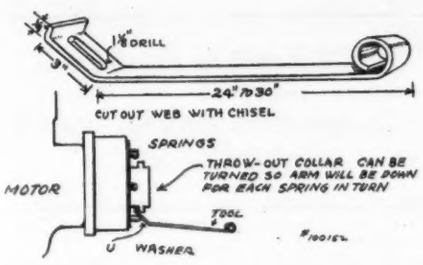
A means for holding the clutch pedal forward in making clutch repairs, and for holding the brake in the depressed position while adjusting and equalizing foot brakes, is afforded by the adjustable fixture shown in the attached sketch. With this fixture practically both pedals of any car can be held in the required position while the necessary repairs are being carried out.

The fixture consists of two parts of wood. One bears against the pedal, which has a "V" groove at one end; the other part is rounded to bear against the front of the seat behind the pedals, and a series of holes into which pins are set to vary the length between the ends.

The fixture works as a toggle to obtain the desired pressure on the pedal, and the second pin is inserted to hold the fixture into position. This fixture can be made up in a comparatively short time and saves considerable delay in the repairs.



Clutch and brake pedal for use in repairshop



Tool for assembling and disassembling valves

Use of Spring Paper Clip in Tube Repairs

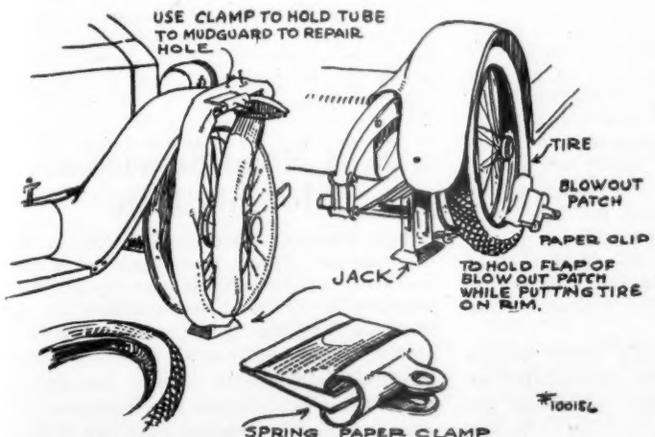
A convenient way to hold the tube while the surface is being scratched clean or while the cement is drying and the patch applied, is to make use of a spring paper clip, used in offices for holding several papers together in files.

Grip the tube to the edge of one of the fenders by means of this spring fastener and the work of patching can proceed without loss of time or work. These clips can also be used advantageously in setting a blowout patch inside a tire. Place a clip in the furthermost edge of the flap which goes over the bead of the tire next to the car. This will hold the flap outside the tire until the casing is entirely on the rim. Without this, the flap frequently gets inside, and much work is needed in removing the tire to get the flap outside.

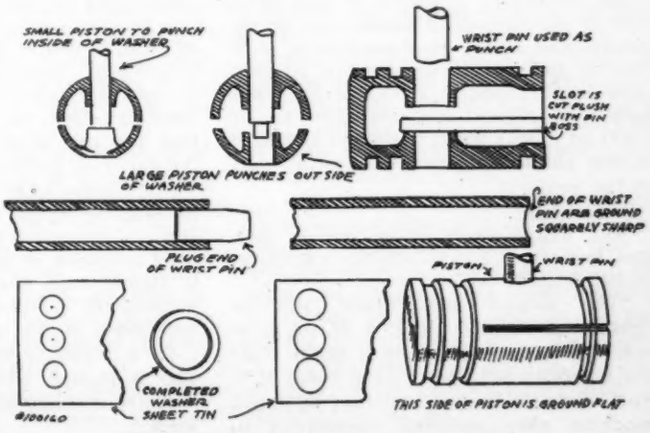
How to Make a Clutch Spring Removing Tool

A simple tool for disassembling and assembling Buick valves as well as the springs on the clutches of such cars as Buicks, Oaklands, and the older model Cadillacs can be quickly and easily made of an old spring leaf. Heat one end of the leaf and bend as shown in the accompanying drawing. The heating will anneal the metal so that two 1⅛ in. holes can be drilled, as shown. The metal between the holes can be cut out with a chisel. To use, the tool is hooked in behind the clutch shifter collar, as shown, and the long leverage afforded by the 24 to 30 in. length of the tool makes it easy to compress the spring.

(The contributor of the above neglected to sign his contribution. If he will oblige us with his name we will be very pleased to give him credit.—Ed.)



Spring paper clip essential in repairing tubes


SMALL PISTON TO PUNCH INSIDE OF WASHER
WRIST PIN USED AS PUNCH
SLOT IS CUT PLUS WITH PIN BOSS
LARGE PISTON PUNCHES OUTSIDE OF WASHER
END OF WRIST PIN ARE GROUND SQUARELY SHARP
PLUG END OF WRIST PIN
PISTON
WRIST PIN
COMPLETED WASHER SHEET TIN
THIS SIDE OF PISTON IS GROUND FLAT
100160

Utilizing old pistons for washer punches

Better Business
Money-making Ideas

Free Emergency Service Gains Friends

Now and then in every city there is an emergency call for an automobile. Someone has to make a trip to a nearby city on emergency business or because of illness or death. Generally such trips are made in taxis or in the cars of friends and relatives. And in these emergency trips there is a splendid chance for a dealer to obtain some good advertising. The dealer could do this by inserting an ad in the local papers reading as follows:

"Free Automobiles for Emergency Trips.

"We know that the car we handle—the Whizzer—always delivers the goods in emergencies. So we have decided to place a car ready for emergency calls to nearby cities at the command of anyone in this call. The use of this car for an emergency—such as illness or death—will be entirely free. Simply call up our garage and we will be glad to take you where you want to go.

"We are doing this because it emphasizes the fact that the Whizzer car is always ready and always dependable."

Undoubtedly the garage would be called on, now and then, to make good on such an ad as this. And when it was called on and made good it could advertise the fact and thereby get some good publicity out of the trip.

Emphasizing Firm's Growth

The public likes to deal with progressive, growing concerns. It is always good business to tell about the growth that has been made by YOUR concern in the automotive business and emphasize the fact that it is your fine equipment, service and work which is responsible for your growth.

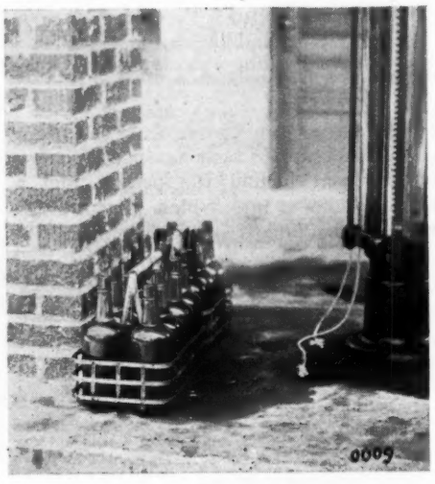
An interesting example of this practice is the successful experience of the Adams and Meyer Machine Works, Fort Wayne, Ind. Just recently this concern used large space in Fort Wayne newspapers to present pictures showing the plant as it was when it started and as it is now and to present the following copy to the public:

"SERVICE.

"Our motto continuously, 1905 to 1921, and hereafter—EFFICIENCY, PROMPTNESS, COURTESY.

"The Adams and Meyer Machine Works was founded in 1905 at its present location. Starting on a small scale the company has grown until today it is Fort Wayne's largest and best equipped machine shop catering exclusively to automotive repairing. During the past year Mr. Adams has installed over $5,000 worth of new machinery, bringing the value of his machine equipment alone to $20,000. Since its start 10 to 30 expert mechanics have always been employed on full time. Three floors are continuously used totaling over 1,000 sq. ft. of floor space."

A dollar will be paid for all ideas accepted as Better Business — Perhaps you have some



Bottled oil increases filling station sales

Show It In Action

"Let the people see it in action" is the slogan of the Float A Ford agency in Cincinnati. It is selling many of the easy-riding devices for them.

A Ford coupe, equipped with the Float-A Ford, is driven through the streets of Cincinnati. Banners placed on the car so they are visible in all directions, front, rear and sides, call attention to the fact that the car is so equipped and invite the motoring public to "watch 'em work."

One banner is at the rear where it can be seen by those behind the car. Another is strung across the front, to attract attention at that end. And another is strung from the radiator cap to the windshield, carrying the message from both sides of the car.

As a result, practically every person who is passed, whether automobilist or pedestrian, finds himself "watching 'em work."

Show Firms How Cars for Salesmen Cut Cost

There are still some few firms employing salesmen who are not thoroughly convinced of the utility of automobiles in taking salesmen over their routes. It would therefore be good business to present a graphic illustration to these firms of the way in which automobiles could serve them.

For instance, the dealer might find out the route covered by one of the salesmen and might then figure the time spent in traveling by steam and interurban roads, time lost by failure to make connections and might also show how delays, due to the necessity of stopping over longer in one town than expected, throw the whole schedule out. Also he might figure up the mileage and railroad fare of such a trip.

Then he might show how a man does not have to run for trains when he drives a car and how much cheaper it is to drive a car than to pay car and railroad fares. Armed with such data, it should be possible for any live wire dealer to sell cars to a firm for their salesmen.

Bottled Oil Increases Filling Station Sales

The time required for filling the crankcase often prevents a sale of oil. Though the amount of time is small, the driver resents the slight delay and drives away, many times with his engine crying for oil.

One filling station proprietor has hit upon the method shown herewith for increasing the sale of oil. A number of old quart bottles have been secured and each filled with oil and set in a conspicuous spot. It takes but a moment for the operator to fill the crankcase with the oil so handy. And often a cork is put into a bottle, a newspaper wrapped about it and the whole laid inside the hood for possible use later on the road. When this is done five cents is charged for the bottle.

Sells Road Service at Monthly Rate

The Forstner Motor Sales Corp., of Chattanooga, Tenn., has organized a co-operative service club in that city and the adjacent territory through which for a stipulated amount per month the automobile owner receives all necessary mechanical road service without additional cost. The club service was inaugurated Aug. 1, and the customer may join either

for one month or one year, as he so desires.

"Forstner road service will serve you on the road, including wrecks, tow-ins, roadside adjustment calls, etc., but excluding tire trouble," the company's advertisement states, announcing this new club. "Twelve months for $10, or $1 per month for one month if you belong to our Forstner Road Service Club."

The company further announced that this service would be available to all paid-up members anywhere within a radius of 20 miles of the station, 24 hours a day, 365 days a year.

With the initial advertisements announcing the club, application blanks were printed for the customer to fill out and send in with his remittance for membership in the service club. The plan is really in the nature of what might be termed service insurance.

Tire Repair Equipment Display Pays

"Put These Under Your Seat" was the sign that recently stopped many passersby to take a second look at the window of the Corydon Vulcanizing Co.'s window at Corydon, Ia. The display consisted of tire repair kits, blowout patches, tire tools, inner tubes, pressure gages and a number of other things that should be under the seat of every car. The display brought an increase of business and paid many times for the small amount of effort and expense required to fix it up.

Cooperative Page That Got Results

A striking example of cooperative advertising among dealers in cars is that recently used by ten dealers in Fort Wayne, Ind.

These dealers combined in the purchase of a two-page spread in a Fort Wayne Sunday newspaper and then all of them inserted advertisements offering $2 and a free automobile ride to the person sending in the best reason for preferring the particular make of car sold by any of the dealers.

With each ad was included a coupon with space for name and address and four lines on which the contestant could write the name of the car he preferred and the reason for his preference. All the answers were sent to the automobile editor of the paper in which the ad appeared and were distributed by him to the advertisers, who then picked out the prize-winning answers. Needless to say, a large number of worth-while prospects were secured through this plan by all the participants in this cooperative advertising scheme.

Solving the Service Problem

The Shryock Automobile Co., of Fort Wayne. Ind,, has a definite plan for servicing the new cars it sells which makes a big hit with the owners and which might be adopted with success by other dealers.

This company, when it sells a car, impresses upon the owner the fact that if he will bring in his car after driving it 500 miles and again after driving it an additional 1,000 miles, that the company will go over it carefully from step to stern and tune it up right. By setting these specific distances at which the owner is to bring in the car, the company leaves nothing to chance, and if the owner does not bring it in after driving it these distances and something then goes wrong with the car, he has no one to blame but himself.

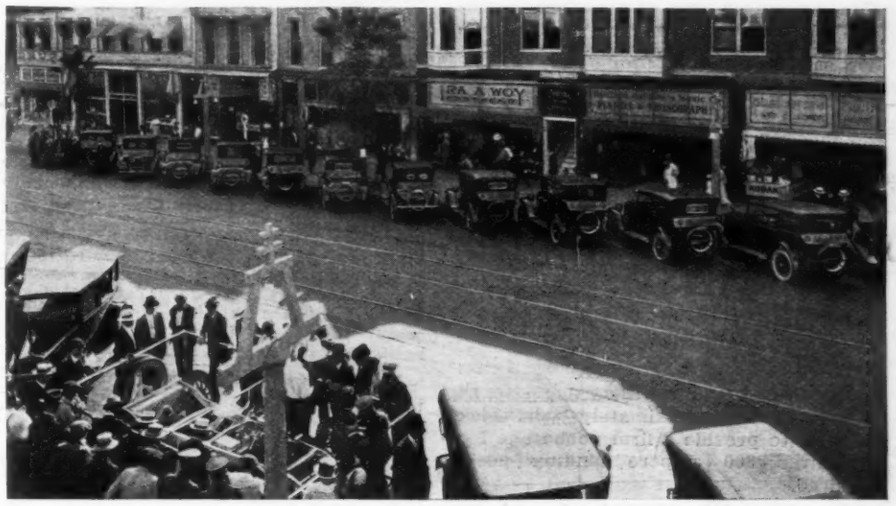
Reach Prospects by Ads on Golf Links

Sportsmen are good automobile prospects so the Corydon Auto Co., of Corydon, Ia., is advertising on the golf links. They have score cards printed which carry their advertisement. The advertising is inexpensive and is read by many who are good prospects.

Personal Testimonial Ads Valuable

Home-town testimonials are just about the best sort of compliments that the dealer can secure. And yet how seldom a dealer makes use of such boosts in his newspaper advertising!

It would be a fine idea for the dealer to keep in touch with people who have bought cars from him and when they come back from long tours to get a little testimonial from them and to then feature this testimonial in ads. For instance, suppose that some owner goes through Yellowstone Park. By finding out about the mountains he climbed, the sand he went through and the little trouble he had and then playing up this data in an advertisement in which his name is mentioned and his picture run, the dealer can secure excellent publicity. Such an ad would please the owner immensely and would also help business a lot.



Dealers Stage Automobile Show in Street

The Riverside County Automobile Trades Assn., with headquarters in Riverside, Calif., recently staged an automobile show at a minimum of expense and a maximum of interest. Mr. J. R. Bowden, secretary-manager of the association, and publisher of "The Citizen," a newspaper of Riverside, conceived the idea of using the city's streets as the stage for the show. The association first secured the permission of merchants granting the different dealers parking privileges for their show cars in front of the stores from 3 till 9 P. M. on Saturday.

The mayor of the city was advised of the plan and he issued a proclamation calling on the people to observe that Saturday as "Automobile Day." Space along Main street was divided up and marked off for two blocks. Each dealer secured his space by allotment. No parade was held, no money was spent, as the idea was to gain attention through the location of the show.

Saturday is the busiest shopping day in Riverside. That alone was responsible for large throngs, but the event brought in hundreds of out-of-town people also who wished to look over the cars and to see them opened up for inspection. The streets were crowded. Merchants who had cooperated to give the automobile dealers space for the show reaped a gratifying benefit, and reported not only a great number of "window shoppers," but a good increase in their business.

Automobile dealers participating in the show reported that they had made more sales than they had ever made at a show before; and the people were well pleased, for they saw an automobile show that did not cost them a cent.

A number of the progressive merchants of the city made special window displays having timely appeal, to link up with the show. One, for instance, a dry goods and women's wear store, borrowed a machine from the Mission Garage, placing it in a window and seating therein a wax figure of a woman in sports clothing, while another figure stood at the front of the car.

The Readers' Clearing House

Questions & Answers

CONDUCTED BY WM. H. HUNT
Technical Editor, Motor Age

Easily Made Battery Discharge Set

Q—Publish a description and drawing of a home-made high discharge battery tester; also, enclose drawing and description of a home-made electrical test bench. The home-made high discharge battery tester is to be one on which different discharging rates can be adjusted in order to test the entire battery.—Franklin Battery Sales Co., Milwaukee, Wis.

See Fig. 1. The active elements of this apparatus are the carbon blocks and the brass end plates. Two sizes of blocks are satisfactory. One of these is 5x5x⅜ in. and the other 3x3x¼ in. There will be 16 of the former and 20 of the latter required. It is not imperative that these dimensions be strictly adhered to and it is permissible to use blocks of somewhere near the dimensions given. This is mentioned for the reason that the concerns which produce them sometimes have in stock moulded blocks of approximately the correct size.

The principle object is to procure enough blocks to pass the high amperage without undue heating. The brass end plates should be the same size as the blocks and approximately ½ in. thick in order to provide a firm anchorage for the large 300 ampere binding posts required.

The frame of the apparatus is made up of iron end plates and angle iron rails all carefully insulated with asbestos wall board. This last should be about ¼ in. thick in order that it may be countersunk deep enough so that there will be no chance of the screws with which it is secured to the metal coming in contact with the carbon blocks or the end plates.

The overall inside dimensions of the apparatus will be determined by the size and number of blocks used. With the compression screw backed all the way out there should be at least ¼ in. distance between the front brass plate and the first carbon block. Sufficient clearance should be allowed between the asbestos lining of the angle iron frame so that the blocks can slide freely without binding. The apparatus will pass 500 amp. for one minute, or 100 amp. for 15 minutes without danger of heating. Should it be desired to build it for higher momentary discharges, additional brass plates can be made and substituted for the carbon blocks at equal intervals throughout the pile. Two or three additional brass plates will be all that will be needed.

The P-R Electric Starter Co., 7335 Vincennes Ave., Chicago, is furnishing complete plans for the making of a home-made test bench. The chief value of the plans, which sell for $1.50, is that they indicate how to use various stock articles of equipment which may be purchased from a number of concerns specializing in them. This leaves the builder free to purchase his equipment to the best advantage.

WIRING FOR VESTA SYSTEM ON FORD CAR

Q—We are working on a 1916 Ford equipped with the Vesta generator and a 6-volt battery (no starter) which needs rewiring.

2—The car is now wired for double contact bulbs; can this be changed to single by installing new plugs and bulbs (single contact)?

3—Can you furnish me with a wiring diagram for same? I wish to wire it for headlights, sidelights, tail-lights, ammeter, horn, coils (ignition); also a dash-light in a series with tail-light with necessary switches.—M. L. Czajkowski, St. Louis, Mo.

1—This generator was designed for use on a two-wire system. However, it can be readily changed over for a single wire system by simply grounding either of the terminals. Before this is done it should be carefully tested all over for internal grounds as, if one exists, the operation will be interferred with.

2—It will not be necessary to change the lamp fittings from the two-wire to the single wire type, as one side of the former can be grounded by simply connecting either of the wires to any metal part of the chassis. For instance, the headlight fittings are usually grounded by attaching them to the radiator hold-down bolts.

3—A simple wiring scheme is shown in Fig. 2. It is recommended that a four-gang switch be used and that the various lines be fused. Either one large fuse between the ammeter and the switch or four small fuses, one in each one of the lines between the switch and the lights may be used. The latter is preferable for the reason that in the event of a fuse blowing, only one circuit is cut out.

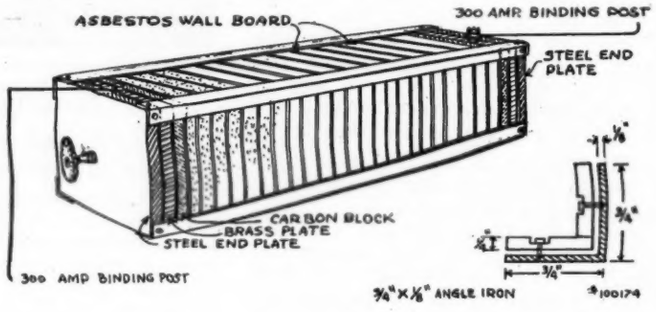


Fig. 1—A shop-made battery discharge set which will pass a large volume of current without heating. Right, details of the insulated, angle iron side rails

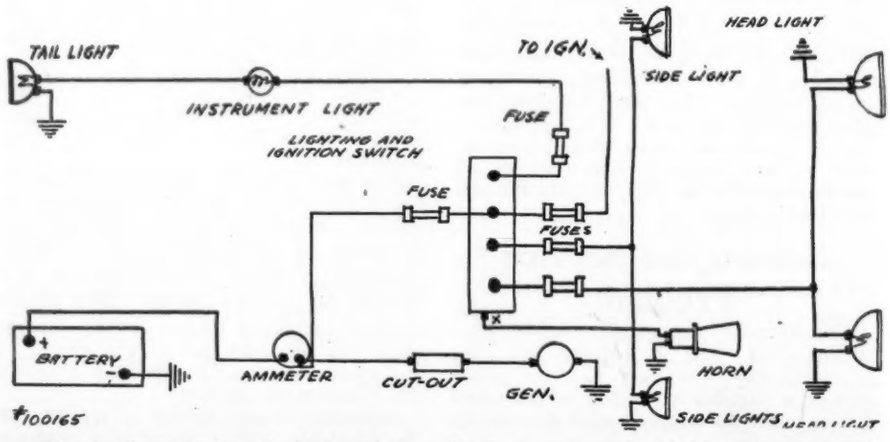


Fig. 2—Suggested method of rewiring a Ford car equipped with Vesta generator

INSUFFICIENT DATA ON IMPERIAL CAR

Q—We have on hand an Imperial automobile that we would like to equip with a Bosch magneto, but we do not know the stroke of this machine and we are writing asking that you help us out.

This is a 6-cylinder motor; on the head of the cylinder is marked 6508, but we think it is only the casing number. The transmission and clutch housing is marked M. T. 2548. This car uses 33x4 casings and we cannot find the motor number. It looks as if this is about a 1916 or 1917 car.

Will you find out the stroke, also the firing order of the motor?—Wm. J. Atchison, Whitmire, S. C.

We regret that we are unable to serve you as we would like for the reason that the data given is insufficient to enable us to determine what model this car is. We are under the impression that the 33x4 wheels must have been installed since the car left the factory, as we can find no Imperial car which was equipped with this size. However, not knowing the model should be no bar to equipping the machine with a Bosch magneto. The bore and stroke has no bearing on the performance of the apparatus. The firing order can be found very easily by having somebody watch the inlet valve while another person turns the engine over slowly.

Beginning with the opening of valve No. 1 watch closely to determine in what order the rest of the valves open. The valve opening order and the firing order are always the same. The stroke can be measured by removing the bottom of the crankcase and measuring from the center of any one of the main bearings to the center of the adjacent crankthrow. Multiplying this measurement by two will give the stroke. Or, if the petcocks are directly over the cylinders, the stroke can be found by inserting a stiff wire or a piece of drill rod and measuring the piston travel from top to bottom dead center.

CAR HAS BAD WHIP IN FRONT WHEELS

Q—We have been working on a Mercer which is one year old and equipped with wire wheels. Running at 30 m.p.h. the front wheels will wobble and whip, and at 40 m.p.h. they will stop. We have taken up all the play in the steering wheel with new bushings. We have tilted the axle forward at the bottom but cannot overcome it. It has been doing this for the past six weeks. There are driving treads on the front wheels. What is the cause of this trouble?—Geo. M. Ferree, Salt Lake City, Utah.

You fail to mention whether this car has been in a collision or has had rough usage recently. The definite instructions for the setting of the front wheels is to comber at the bottom between ¼ and ½ in., and give them a gather at the front of about ½ in. Also tilt the top of the steering knuckles back about ½ in. However, following these instructions will not entirely remedy matters if the front axle is out of line or if the steering arms are not set at the proper angle in relation to the spindles and the rear axle.

The meaning of this last sentence is illustrated in Fig. 3. This is known as the Ackerman principle of steering and it will be noted that a line drawn through the center of the steering knuckle bolt and the steering arm bolt will pass through the exact center of the rear axle. If the arms fail to check on this point it will be necessary to spring them until they do. The wheels are then adjusted as directed in the previous paragraph.

After these points are attended to it will be well to be certain that the front axle is in proper position on the front springs. A shifting on either side at these points will, of course, cause misalignment which is almost certain to result in the decided whipping action complained of.

The Readers' Clearing House

THIS department is conducted to assist Dealers, Service Stations, Garagemen and their Mechanics in the solution of their repair and service problems.

In addressing this department readers are requested to give the firm name and address. Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been asked by someone else and these are answered by reference to previous issues. MOTOR AGE reserves the right to answer the query by personal letter or through these columns.

Emergency inquiries will be replied to by letter or telegram.

WOBBLING WHEELS ON NINE-YEAR-OLD CAR

Q—On a 1912 model Mitchell light six roadster, the front wheels have a bad habit of wobbling when the car is driven about 10 m.p.h. over rough roads. The car has been in operation nine years; the wheels wobbled the day the car came from the factory, and still wobble. The fact that this condition was present when the car was new points that it is not caused by worn or loose parts. King bolts-bushings, tie rod bolts and bushings all fit snug; steering wheel has about the right amount of play; nevertheless, the wheels wobble, though not when the car is driven fast or on smooth roads. We have noticed other cars with the same trouble; and others where everything was worn and loose, and wheels did not wobble. What is the cause?—C. L. Miller, Kimball, S. D.

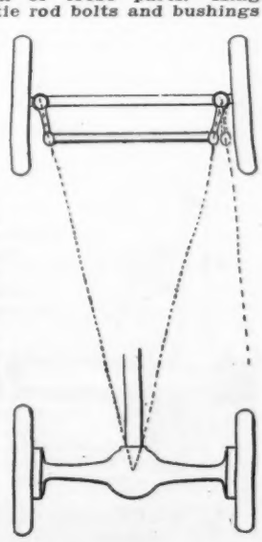


Fig. 3 — The Ackerman steering linkage design; lines through the steering spindle arms meet in the center of the rear axle

Refer to Fig. 3 and reply to Mr. George M. Ferree.

It is likely that the steering spindle bolts are not tilted back at a great enough angle.

VALVE SEATS CARBONIZE RAPIDLY

Q—We are experiencing some trouble with the valves of a 1921 Buick 6, which, although they have been reground three times, collect carbon on the seats which hold them open. The trouble developed in about the first 200 miles. We find the valves stick in the guides very badly. We have used emery cloth to smooth the stems before replacing them, but find this does not remedy the trouble. Could it be possible that the valve stems have too close a fit to the valve guides and expand when they get hot and thick?

The owner says he oils the valve stems very frequently. This may cause the trouble to some extent, as the oil, going to the bottom of the stem, burns and forms carbon.—Lexington Avenue Garage, Winchester, Ky.

The fact that the owner oils the valve stems leads us to believe that he is one of those rather fastidious persons who cannot endure a valve click and insists on having the tappets set too close. If this is the case no amount of grinding will remedy matters as the valves do not fully seat themselves and, of course, this has the effect of allowing the seats to be badly burned and pitted.

It is a mistake to emery the valve stems as this will very quickly bring them down to undersize and allow leakage. The stems were of the correct size when they left the factory and they will wear to undersize rapidly enough without the aid of emery. Of course, when grinding them it will be necessary to scrape off the carbon shoulder. However, this had best be done with a knife and not with emery.

As you have surmised, oil placed on the stems will run down to the shoulder, and burning, form a carbon deposit which will aggravate matters badly. We suggest that the valves be ground in again and adjusted to a clearance of .006 in. for the inlet and .009 in. for the exhaust. Advise the owner to let them click for a few days until they become seated and again adjust to a clearance of .004 in. and .007 in. respectively.

EMERY CLOTH A POOR SPARK PLUG CLEANER

Many repairmen insist upon removing the discoloration of spark plug porcelains with emery cloth or sand paper. This is very poor practice, as while the harmless discoloration is removed quickly it is at the expense of the fine highly glazed finish of the porcelain. This leaves a rough surface which very quickly collects carbon again. The discoloration had best be removed with a knife.

MISCELLANEOUS

ADJUSTING CHEVROLET 490 REAR AXLE

Q—Publish the name and address of the firm that is going to manufacture the 6-cylinder steam car in Indianapolis—the one that is to sell at about $1,000.

2—Explain how to adjust the rear axle of the Chevrolet. How do you tell when you have the ring and pinion gears adjusted, as you have to take the axle housing and main shaft housing off to see them? How can you tell when they are all right when you put them back together?

3—In motor and generator winding does each coil start at one segment on the commutator and terminate on the next segment?—D. C. Slick, Granite City, Ill.

1—Coats Steam Car Co., Merchants Bank Bldg., Indianapolis.

2—The ring gear is centered by means of thrust washers each side of the differential case as shown in Fig. 4. The procedure is to assemble the axle with an equal number of spacing washers on each side. The pinion is then painted with a light coat of Prussian blue or lamp black and the pinion assembly installed. After having given the pinion shaft a few turns the assembly is taken off and the ring gear inspected. It should show almost a full tooth bearing. If the bearing is only on the edges of the teeth the ring gear must be shifted to the right—toward the pinion—by taking out one of the spacer washers from the right side and placing it on the left side. This is to be continued until a nearly full tooth bearing is obtained. When this is accomplished there should be but a few thousandths of an inch backlash between the pinion and the ring gear.

There is no adjustment for the pinion and it should not be necessary to adjust it unless it is replaced with a new one. In this event the instructions are as follows: should it become necessary to replace the drive pinion, extreme care should be exercised to see that the tapered hole of the gear fits the taper on the shaft snugly and at all points. Always before putting the new pinion on the shaft remove the cotter pin holding the adjustment nut and turn the nut back two or three turns.

As it is impossible to machine two tapered holes exactly alike, one gear may "go on" a little farther than the other, so if the adjustment were not changed the gear would shoulder against the bearing before obtaining a good seat on the shaft. It is a good plan to try the fit of the pinion on the shaft before finally assembling. The best way is to apply a little Prussian blue to the pinion, spreading it thinly around the bore. Press the pinion on the shaft, then remove and note the marks made. If the bearing is uneven smear a little valve grinding compound on the shaft and with a twisting motion grind the pinion to its seat.

Much depends upon securing a good snug fit, so take your time, as it is a good insurance against roadside repairs.

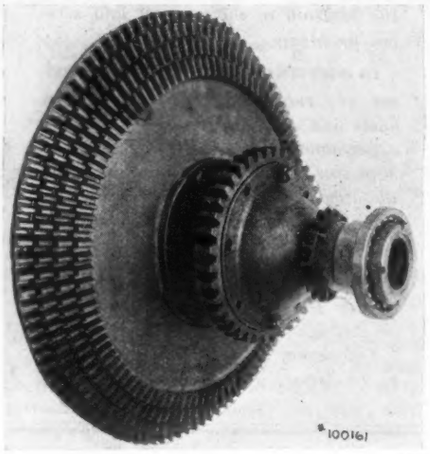


Fig. 5—The quadruple ring gear used in the Ballot racing car

After having secured a good fit and made sure that the key is unworn and full size, securely lock the nut and start the cotter pin. The adjusting nut should then be set up and securely locked with the cotter pin. Care must be used not to get the adjustment too tight; however, it should be snug. If the holes for the cotter pin will not line up without getting the bearing too tight or too loose, make a washer of tin or brass and insert between the nut and the center thrust bearing washer. In replacing the propellor shaft and the bearings of the propellor shaft housing care must be used not to crowd the bearings. Be sure to line up the hole in the bearing sleeve with the hole in the housing for the pinion shaft bearing lock stud, after which replace the stud.

3—This depends entirely upon the type of armature used. In some of them the connections are made to the adjacent commutator segments, while in others the windings are connected to segments that are quite widely separated, in many cases being almost diametrically opposite each other or at the approximate 180 deg. point. A very good book of blue prints showing the armature windings and connections for 175 different types of automobile starters and generator armatures may be procured from the Associated Electric Service Stations, Suite 412, 105 W. Monroe St., Chicago.

REMOVING CLUTCH FROM 1916 DODGE BROTHERS CAR

Q—Advise how to remove a Dodge Brothers clutch and transmission on a 1916 car. It is a cone clutch. We want to put new leather on.—C. W. Bingeman, Trevorton, Pa.

To remove the cone clutch, disconnect the accelerator shaft, brakeshaft, brake pull rods and remove the muffler with the exhaust pipe connected to it. Then disconnect the universal joint housing support bolts and slide the housing back about 2 in., which will give access to the universal joint, which in turn should also be disconnected and the torque assembly dropped down so that the transmission will clear it. Then remove transmission bolts, after properly supporting engine from beneath. The transmission can then be pulled back, and the clutch can readily be removed after unscrewing the clutch spring adjusting nut.

DETAILS OF BALLOT RACING CAR AXLE

Q—Publish or tell us where we can obtain a detailed drawing and description of the Ballot racing car rear end.—Burt M. Filber, Jacksonville, Fla.

See Fig. 5. Aside from the four rings gears and pinions, this differential is practically the same as the conventional type. Manufacturer: Ballot Motor Co., 103 Boulevard Brune, Paris, France.

NEW GEARS IN AXLE ARE NOISY

Q—Can you tell us why, after putting in new gears in differential and transmission of Overland 90, the axle has a humming noise? The bearings are adjusted right. The humming has been in the car for nearly a year.—N. B. Jones Garage, Opelika, Ala.

Assuming that you are correct in your statement that the bearings are in correct alignment, we are led to believe that you have fallen into the common error of attempting to match an old pinion

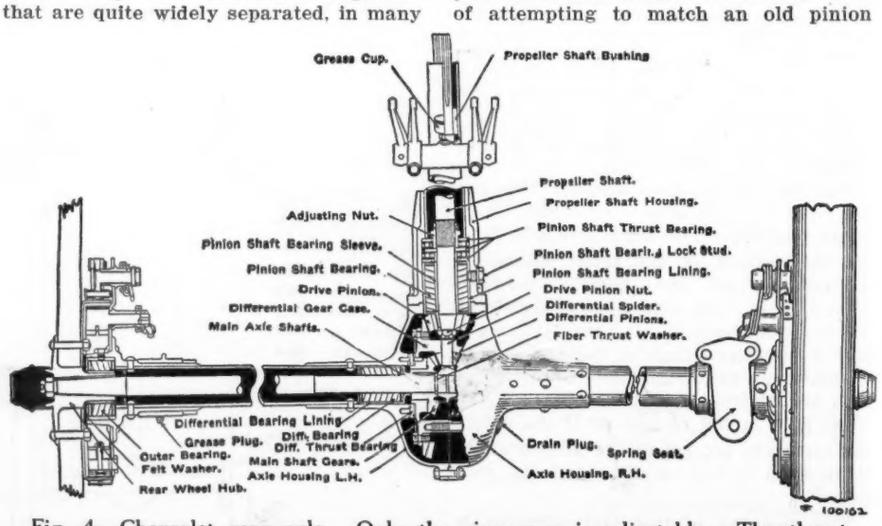


Fig. 4—Chevrolet rear axle. Only the ring gear is adjustable. The thrust washers on each side determine how deeply it meshes with the pinion

gear with a new ring gear. This almost invariably results in the objectionable humming or growling. So true is this that one of the large axle manufacturers puts ring and pinion gears through production from the rough blanks to the finished gears in pairs and strongly urges that when one is replaced that its mating gear be replaced at the same time.

The replacement of both gears with a pair that have been carefully mated will doubtless remedy matters. An emergency expedient which sometimes gives good results is to grind the gears to a mate with emery. This is done by applying emery powder and oil to the ring gear and driving the axle slowly until a fit shown by a coat of Prussian blue or lamp black is obtained. After the job is finished it will be necessary to completely disassemble the axle and carefully wash out all the abrasive. This is a makeshift and it is recommended that the better plan of replacing the gears with mated ones be adopted.

INFORMATION ON BUICK TRACTOR ENGINE

Q—We have several Buick tractors which have been purchased from the British government. The power unit is a 6-cylinder engine. These were delivered in December, 1918. We think they are about the same model as the 1920 Buick. We are having considerable trouble in getting the r. p. m. Kindly publish the power curve of same?—Electrical Garage & Equipment Co., Hove, England.

See Fig. 6. It will be noticed that this engine developed its maximum at 2,200 r. p. m.

TWO-CYLINDER HEAD GASKETS REDUCE COMPRESSION

Q—What effect would putting on two gaskets on a cylinder head of a 6-cylinder car, 1920 model, have? Would this tend to reduce heating of the engine?—Fred Hartman, Albert, W. Va.

1—The effect of the extra gasket will be to increase the size of the combustion chamber slightly, which will result in a lowering of the compression. The engine may be a trifle sluggish in action,

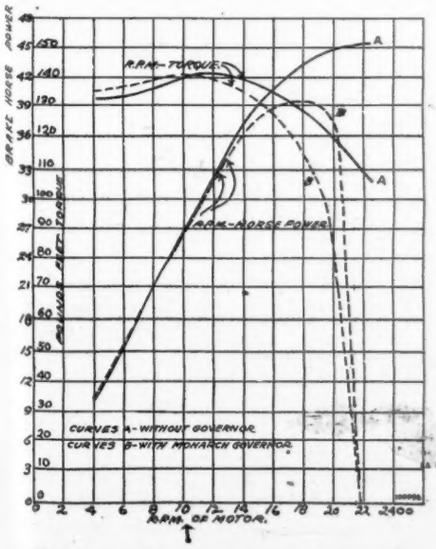


Fig. 6—Complete test chart of Buick tractor engine supplied to British Government

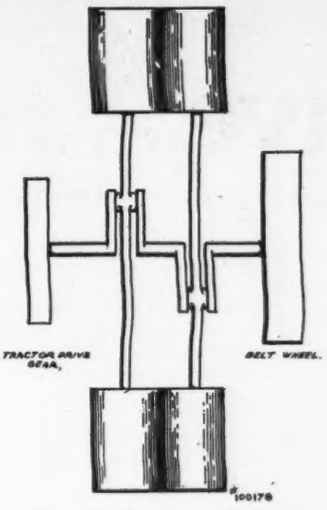


Fig. 7—Layout of four-cylinder opposed tractor engine crankshaft and connecting rods

but on the other hand the difference may not be noticeable.

2—Yes. It will have a tendency to reduce heating.

MYSTERY TALE

Tractor Engine Has Worn Main Bearings

Q—The accompanying sketch (Fig. 7) is the layout of a four-cylinder tractor. The wear on the connecting rods presents a problem which we cannot understand. When the tractor is being used for road work the rod bearing nearest the belt wheel wears the fastest. Perhaps you or some of your readers may have had a similar experience and have found the remedy.—G. S. Sprague, Exeter, Nebr.

We are of the opinion that the peculiar wear is being caused by loose main bearings. Should the bearings be worn it is obvious that the crank will be thrown out of alignment to one angle or the other depending upon the end from which the power is being taken. When used for belt work the misalignment will be greater at the flywheel end and vice versa. Opinions from tractor experts are requested.

WHERE TO GET PARTS FOR REDDEN TRUCK UNIT

Q—Inform me where I can get parts for my Redden truck unit.—W. J. Lockard, Yuma, Colo.

The parts from which this unit was assembled were used in several other makes of units handled by a number of concerns. Among these are the Hudford Co., 1448 S. Wabash Ave., and the Dearborn Truck Co., 2911 Indiana Ave., both of Chicago.

WHICH WHEELS LEAVE GROUND?

Q—Do the right or left wheels leave the ground when an automobile makes a lefthand turn at a high speed?—Irving Putterman, New York, N. Y.

The lefthand wheels. To get a clear idea of the matter, take an exaggerated view of it. If, instead of making a comparatively slow lefthand curve, the machine was suddenly turned at complete right angles to its forward course, is there any question that it would promptly capsize, rolling over and over toward the right? Or say that the righthand wheel suddenly struck a high curb. It is quite plain to see that the sudden arresting of the car would result in its again rolling over toward the right. In either case the lefthand wheels would, of course, leave the ground.

NO COMPLETE MAXWELL INSTRUCTION BOOK PUBLISHED

Q—Will you kindly let us know where to get a book of complete Maxwell instruction such as you often see advertised for Fords?—R. J. Kelly, Roca, Nebr.

To the best of our knowledge there is no such book in print. Short of the Maxwell company, we do not know where such instructive matter can be obtained.

CHANGING CHEVROLET CAM FOLLOWERS NOT RECOMMENDED

Q—Would you advise changing the bottoms of the push rods of a Chevrolet 490 touring car engine from the stock form shown in Fig. 8 to the mushroom type shown in Fig. 9.

2—Would such a change effect the opening and closing of the valves, and would it be possible to adjust the valves so the engine would run properly?—Thomas Born, Cleveland, O.

1 and 2—It is not recommended that the cam followers be changed from the modified "V" form type shown in Fig. 14 to the mushroom type shown in Fig. 15, for the reason that the cams of the engine were designed to operate the valves in perfect time through the medium of the first mentioned cam followers, and if these are supplanted by the mushroom type the timing will be so completely upset that the engine will not operate satisfactorily.

NO ONE-WHEEL DRIVE CARS

Q—Are there any successful lightweight cars made, driving on one rear wheel?

2—What is the tread, weight and wheelbase of such cars?

3—Can a standard 56 in. tread car be driven on one wheel successfully, car weighing 1,000 lbs?—S. P. Metcalfe, Huntsville, Ala.

1 and 2—During the cycle car period there was one or more cars made with the single rear wheel drive. At the present time we know of no make of machine using this construction.

3—There is no good reason why a car cannot be driven in this way, but how successful it would be is a problem. We urge that it be not attempted.

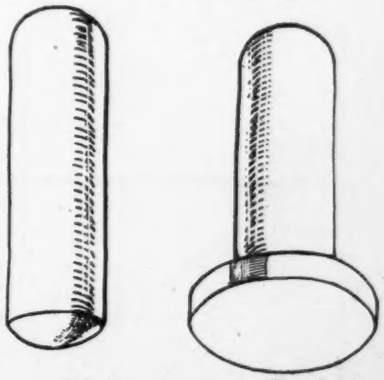


Fig. 8 Fig. 9

Left—Modified "V" type cam used on Chevrolet 490 engine and, right—the mushroom type which an inquirer contemplates installing

Automotive Architecture

Planning & Building Problems

Conducted by Tom Wilder

Garage and Service Station

PLAN 357

Q —Will you kindly assist us in our plans for a garage and service station which we want to start building?

We are going to handle one passenger car and one truck agency and employ 8 or 10 men in the repair department.

Our lot is 60 ft. by 140 ft., and we would like to cover it.

The pitch of the roof will be about four inches to the foot. The roof will be of steel truss with no posts inside the building.

We want to make the front of brick with show windows and the sides, perhaps, of cement blocks or hollow tile.

We cannot go more than four feet below the ground on account of the sewer, so our heating plant will have to set not more than four feet below the floor, which will be concrete.

We would like to have your assistance in showing us how our front elevators ought to look, as we want a good-looking front, and how our entrance should be; also make suggestions on a heating and ventilating plant, skylights, location of shop, office, stockroom, showroom, etc.

We also expect to sell gas, oil and accessories, and possibly take in a little storage.—A New York Reader.

On your sketch you say you would prefer the building on the north side of the lot; consequently, we have drawn the plan for that position. If you install a filling station on the southeast corner, however, we would advise you to consider a layout along the line of the small half-size sketch at the top. This will bring the showroom and accessory store in closer relation to the filling station, with a possible benefit to sales.

With so much land at your disposal we cannot see the need for building up into the air. With a one-story building you will have no elevator maintenance and the advantage of good light everywhere. Later, if you need more room, you can build a second story over some part. Here, again, it would be wise to plan where the second story is to be built, in order not only to insure a good building but to make the addition as economic as possible—that is, to avoid tearing down too much of what you will have already.

Should you build as shown in the small sketch, you will have a large yard behind the building, hidden from the street and available for storage-washing or any other outdoor use.

Automotive Architecture

IN this department MOTOR AGE aims to assist its readers in their problems of planning, building and equipping service stations, garages, dealers' establishments, shops, filling stations, and in fact any buildings necessary to automotive activity.

When making requests for assistance please see that we have all the data necessary to an intelligent handling of the job. Among other things we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated, and how large it is expected they will be.

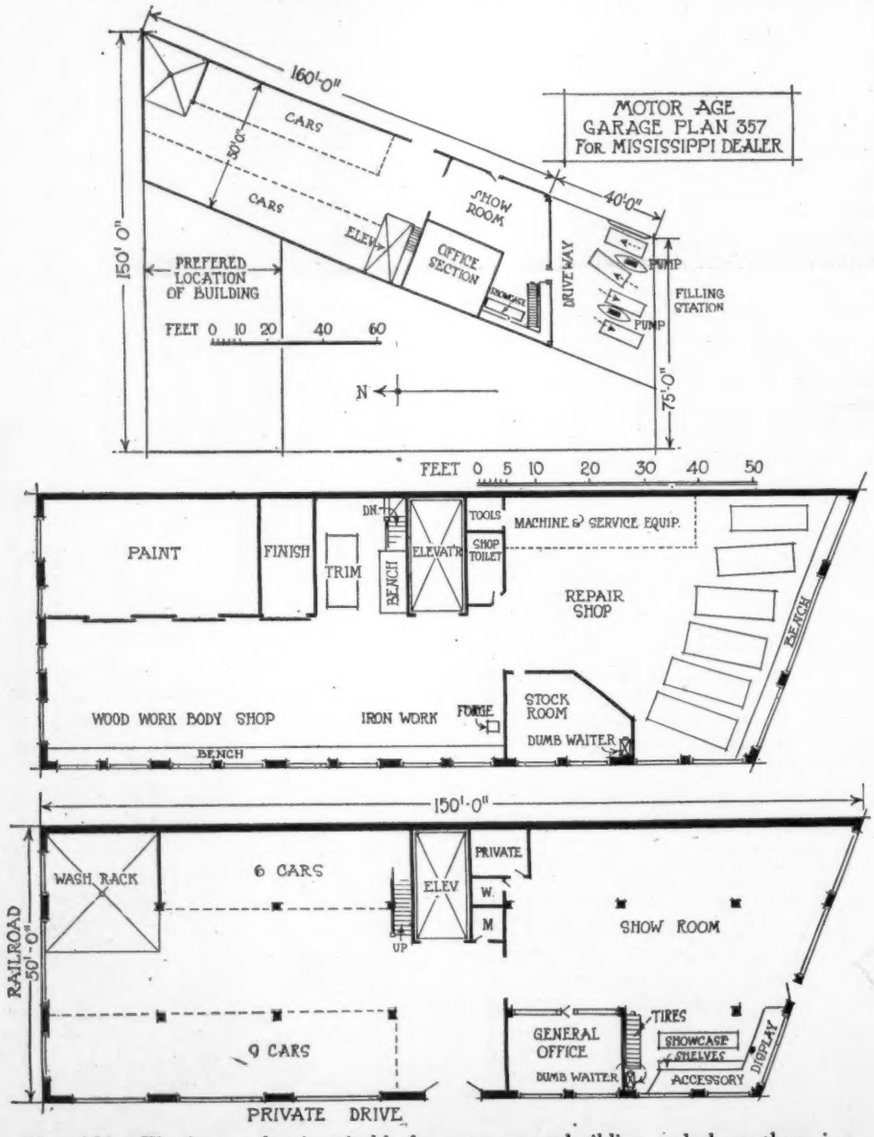
Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repairshop.

And how large an accessory department is anticipated.

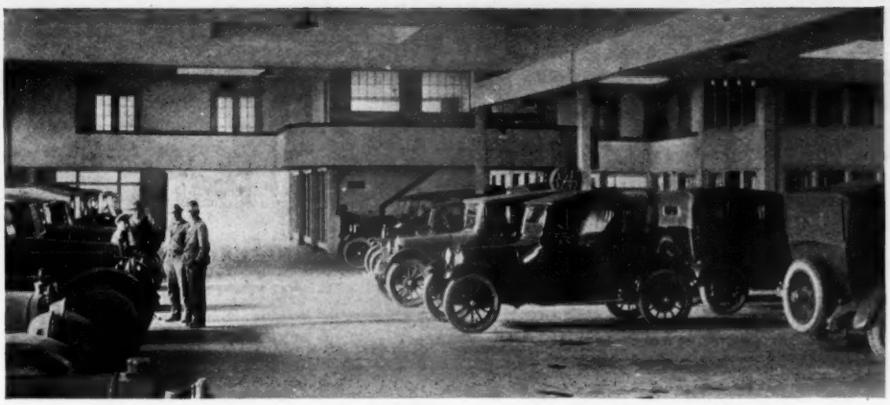
Service Station on Odd Shaped Lot

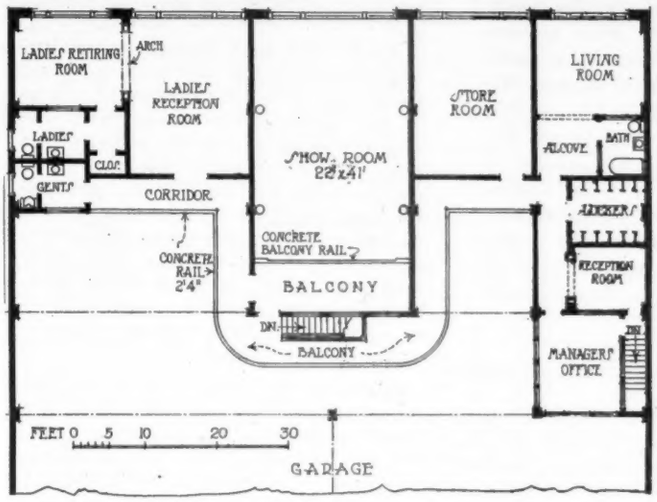


Plan 357—The lower plan is suitable for a two-story building and above there is a suggestion for a different layout

CANCELS INSURANCE POLICIES

Greensboro, N. C., Aug. 24—The Automobile Insurance Co., of Hartford, Conn., has notified its Greensboro agent that effective at once all North Carolina insurance policies on automobiles protecting the owners from fire and theft will be canceled. The extraordinary number of fires and thefts are responsible for the cancellation.





In this interesting layout the balcony surrounds the show room and extends across the whole front of the garage, giving space for many novel features

Interesting Garage Features

A $55,000 building comprised of a garage, salesroom and repairshop has recently been completed by the William J. Silva Motor Car Co., Modesta, Calif. It is a very well equipped and complete unit. The garage occupies 90 ft. on "H" street, and is 175 ft. deep, while the shop and service departments wing on Twelfth street has 75 ft. frontage and is 50 ft. deep.

The photograph and plan of the building give a very good idea of the front arrangement.

A large, double driveway at the entrance and exit permit two cars to pass simultaneously through either doorway.

A stairway in the rear of the showroom leads to the mezzanine floor, where are located the salesmens' offices, ladies' restrooms, gentlemen's lavatories, special offices, locker rooms for the office employees and floormen, shower baths for travelers and employees, and the general manager's private office. The restroom feature will appeal to the women, as the rooms are furnished with fine rugs, wicker furniture and large plate glass mirrors.

The private offices of the general manager are so arranged that he may sit at his desk and view every portion of the main floor, and as they are directly over the business offices, a stairway has been built connecting the two offices.

The front part of the structure is built higher than the garage and service station in order to give ample room for the mezzanine floor and balcony.

Practical Tire Merchandising and Repairing

Continued from page 19

when there is a curing job directly opposite the valve stem, the big end of the valve should never be pulled through the valve base, because nine times out of ten such practice will rupture the fabric and will make it almost impossible to prevent subsequent leaks around the valve.

PUSH VALVES IN THE TUBE

The proper procedure when temporarily removing a valve is first to take off the retaining nuts and then to push the valve into the tube and let it drop down out of the way. After the repair job has been finished the valve can be pushed back into the valve base without danger of harming the fabric.

Valve bases are generally applied at the factory in one or two ways—either with acid cure cement or with pure para cement.

In either case, the old valve base can be removed very easily by heating gently on the tube plate. For this purpose it can be clamped to the plate for two or three minutes when it will peel off the tube quite readily.

The operation of applying a new valve base is much the same as making a splice with acid cure. The tube is first repaired by careful buffing and roughening and two light coats or one heavy coat of acid cure cement applied. The valve base is treated in the same way by buffing and cementing.

When the cement is tacky, the acid cure is brushed on and the new valve base quickly laid in place and stitched down with a beaded stitcher. It should then be laid flat on the bench under a comparatively heavy weight for 20 minutes or so.

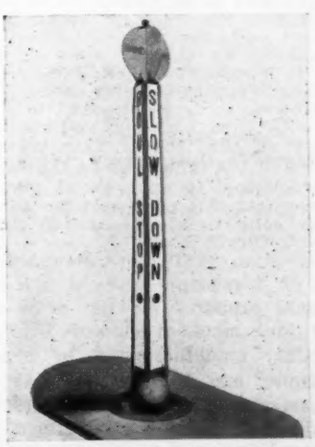
If the valve base is put on with para cement the procedure is exactly the same.

The next and last article of this series will deal with repairing fabric tires.

Traffic Post With Safety Feature

THE large increase in automobiles in the past few years has made it imperative that a device be placed in the middle of prominent streets and highways to keep traffic on the proper side of the road and to provide an island crossing for pedestrians. The safety traffic post shown in the illustration has the post mounted on a cast iron ball and socket arrangement, holding the spring upright by means of a strong vertical spring attached to the bottom of the ball and anchored below to the base by means of two spring pinions located in the base and engaging with the ball. This arrangement allows the post to be knocked over when struck by a machine, doing no damage to either machine or occupants, and in most cases, none to the post itself.

The upper part of the post is made of sheet steel and angle iron—a light but strong construction. The sheet steel is stenciled with such warnings as "Drive Slow," "Dangerous Curve," "R. R. Crossing," etc. This stenciling is backed with red glass and the entire post illuminated from the inside by means of reflectors and two ordinary nitrogen lamps. The device is made by the Beacon Safety Post Co., 117 N. Wells St., Chicago.



Beacon safety post

Legal Problems

Conducted by Wellington Gustin

Legal Service

SEEMINGLY knotty legal problems are constantly arising in the dealer's business, which even a slight knowledge of the law easily may solve. MOTOR AGE presents here the most common legal problems which confront the dealer. Mr. Gustin, a member of the Chicago bar, not only is well versed in the law relating to the dealer, but presents it in such a way as to be readily understood by the layman. In addition to his articles, Mr. Gustin will gladly answer such individual inquiries on knotty points as may be submitted to him.

Sellers Should Watch Description of Cars in Mortgages

Q—I am a dealer and sold a car to a customer on deferred payments, taking a chattel mortgage on the car to secure the balance of the purchase price. Subsequently this customer became hard-pressed for money and sold the car to a third party. I have demanded the car under my mortgage, but the purchaser's lawyer has advised him not to give it up, contending that the mortgage as recorded was not sufficient to give notice that there was a claim against this particular car, since it was not described with sufficient details, and therefore he was an innocent purchaser for value and without notice, and as such had full title to the car. The description given in the chattel mortgages states: "One Cole coupe now in the possession of James Jarvis (the purchaser) in Cook County, Illinois."

Do you think I can foreclose my mortgage on the car?

A—Your mortgage, while good against the maker, your purchaser, is not good against third parties who repurchase without actual knowledge of your claim against the car. The purpose of the recording acts is to give notice to all as a matter of law, but where the property covered is not sufficiently described, the recording of the mortgage does not give notice. Describing an article by its class name is not sufficient; so, describing a car by its name, make and kind is not sufficient in a test, and the dealer will do well to make note of this point if he would make sure against losses in taking mortgages back when he sells a car on time payments.

Question of Lien for Price of Tires

Q—We sold to a party in our city two 32x4½ in. pneumatic tires for a Ford truck. This party was to pay us $5 a week. He paid about two payments and, without our knowledge, sold this truck. Can you give us an opinion as to whether we can hold the truck in the hands of an innocent party for the price of our tires? If so, refer us to decisions and, if possible, to Mississippi cases.

We have another similar case. We sold two tires on an International truck. These were solid tires, which, as you know, form a part of the truck. This truck was handled in the same way as the first one, the truck sold to an innocent purchaser. Can we hold this purchaser for the price of our solid tires?—Mississippi Automobile Co., Tupelo, Miss.

A—Section 2435 of Hemmingway's Code of Mississippi gives a lien on all personal property for the price of the labor and material employed in "constructing, manufacturing, or repairing the same," and the mechanic may retain possession of said property until the bill is paid, and if not paid within 30 days, he may bring suit to recover and, upon obtaining judgment, may sell the property for payment. If the mechanic parts with possession he shall retain his lien while it remains in the hands of the first purchaser, or of one deriving title or possession through him, with notice that there was a lien remaining unpaid.

Under the state act I am of the opinion that you would have no lien on the Ford truck nor the International since you say each was sold to an innocent purchaser. However, for your own information, I might suggest that as a matter of law the purchasers of these trucks may not be "innocent purchasers." Filing or recording of liens ordinarily is done to give notice to all the world so that none may set up the claim of being an innocent purchaser. This is the very reason for enacting the recording acts in the various states.

If the purhcasers had actual knowledge of your lien claims or if you had recorded your liens, then they would not as a matter of law be innocent purchasers.

Whether or not the tires, in each case, were repairs coming under the statute giving a lien to a mechanic, I am of the opinion, is a question of fact in each instance. But this question does not enter into your problem as presented.

Law Compelling Concrete Floors

Q—Advise if there has been a law passed in the state of Illinois which requires that all garages have concrete floors?

A—We know of no such state law, though some towns and cities might have an ordinance, and fire policies might call for such requirement as a condition for writing a policy of insurance.

Charging Storage On Repaired Car

Q—Advise whether a garage can charge storage on a car they have repaired when the car owner is unable to take same out just as soon as it is completed. They refuse to accept note or part payment on account. This is the state of Nebraska. —E. B. Downs, National Home, Wis.

A—As soon as a garage or repairman has repaired a car and tendered it back to the owner he has performed his part of the agreement to repair, and would be entitled to charge for storage thereafter should the owner not take the car away. While the car is in his possession he must use care to see that it is not damaged through his neglect, and he assumes other duties the same as a storage man. Of course, a party would have a reasonable time within which to get his car after notification of its repair and readiness for delivery.

However, if a garage bill is inflated a party cannot be compelled to pay for the inflation—that is for service or repairing not actually done; and if the unwarranted charges were the cause of the controversy and the refusal to pay, then, upon such proof, a charge for storage would not be proper. In a case where the repair charges were improper and the garage holds the car to collect such improper charges, the owner should be able to get damages for the withholding of the car.

Community Garage in Residential District

Q—I propose to put up a garage for storage by owners of about 30 cars. Each car owner will own part of the garage and may store the car which he drives. We propose to locate this in our neighborhood which is now devoted exclusively to residences. There is a restriction in the deed of the land where the garage is to be located against certain named offensive businesses or other building offensive to good neighborhood. Now some of the people in the neighborhood are objecting to the garage project and threaten suit, claiming the garage is public, offensive, etc. May we proceed, in your opinion, without being enjoined?

A—This is a very debatable proposition. The deed covenant does not prohibit you, it appears. The garage you propose to build would be free from any of the objectionable features of a public garage and should not be offensive to good neighborhood. Note that this covenant does not refer to a residential neighborhood and runs against certain businesses regarded offensive. Your complainants will have to show more equity and right on their side to prevent the erection of this type of garage.

Fan Belt Sizes and Types
1921 Trucks

Motor Age Maintenance Data Sheet No. 164

One of a series of weekly pages of information valuable to service men and dealers—save this page

Name of Model	Capacity or Rating	Type of Belt	Width of Belt	Length of Belt	Degree of Angle if Vee Type
Sanford, 50	5	Flat	1⅛	31	.....
Schacht, E	3½—5	Vee	⅞	36	45
Schacht, E	2 —2½	Flat	2	36	.....
Schwartz, B2	1½—2½	Flat	2	33⅛	.....
Schwartz, C2	2½—3½	Flat	2	33⅛	.....
Schwartz, D	6	Flat	2	38⅜	.....
Selden, 1½A	1½	Flat	1¼	41	.....
Selden, 1½B	1½	Flat	1¼	41	.....
Selden, 2½A	2½	Flat	1½	31	.....
Selden, 3½A	3½	Flat	2	34¼	.....
Selden, 5A	5	Flat	2	40⅜	.....
Seneca, M	½	Flat	¾	32	.....
Service, 220	1	Flat	1	37¾	.....
Service, 31	1½	Flat	1¼	33	.....
Service, 36	1½	Flat	1¼	33	.....
Service, 41	2	Flat	1¼	33	.....
Service, 51	2½	Flat	1¼	33	.....
Service, 71	3½	Flat	1¼	33	.....
Service, 76	3½	Flat	1½	38¼	.....
Service, 101	5	Flat	2	38¼	.....
Standard, 1K	1	Flat	1¼	39¼	.....
Standard, 76	2½	Flat	1½	31⅜	.....
Standard, 66	3½	Flat	1½	36½	.....
Standard, 86	5	Flat	1½	36½	.....
Sterling	1½	Flat	1½	38	.....
Sterling	2	Flat	1½	38	.....
Sterling	2½	Flat	1½	38	.....
Sterling	3½	Flat	1½	40½	.....
Sterling	5W	Flat	1½	40½	.....
Sterling	5C	Flat	1½	40½	.....
Sterling	7½	Flat	1½	40½	.....
Stewart, 11	¾	Flat	¾	34½	.....
Stewart, 12	1	Flat	1¼	37	.....
Stewart, 9	1½	Vee	⅝	41¼	30
Stewart, 7	2	Vee	⅝	37½	30
Stewart, 7X	2½	Flat	2	39½	.....
Stewart, 10	3½	Flat	1½	40 3/16	.....
Stewart, 10X	3½	Flat	2	39½	.....
Sullivan, K	1½	Flat	2	33⅝	.....
Superior	1	Flat	1	45	.....
Superior	2	Flat	1	35	.....
SuperTruck, 40	2	Flat	1½	43	.....
SuperTruck, 50	2½	Flat	2	37½	.....
SuperTruck, 70	3½	Flat	2	37½	.....
SuperTruck, 100	5	Flat	2	42	.....
Texan, T	1	Flat	1	33½	.....
Tiffin, GW	1½	Flat	1¼	32	.....
Tiffin, MW	2½	Flat	1¼	35½	.....
Tiffin, PW	3½	Flat	1½	35½	.....
Tiffin, TW	5	Flat	2	47	.....
Tiffin, UW	6	Flat	2	47	.....
Titan, 2½	2½	Flat	2	34	.....
Titan, 3½	3½	Flat	2	35	.....
Titan, 5–6	5/6	Flat	2	35	.....
Tower, J	1½	Flat	1¼	32¾	.....
Tower, H	2½	Flat	1¼	32¾	.....
Tower, G	3½	Flat	1½	34¼	.....
Traffic, C	2	Flat	1¼	41	.....
Transport, 20	1	Flat	1	36½	.....
Transport, 30	1½	Flat	1¼	40⅜	.....
Transport, 50 Cont.	2½	Flat	1¼	31½	.....
Transport, 50 Buda	2½	Flat	2	32¾	.....
Transport, 70	3½	Flat	2	35⅞	.....
Traylor, B	1½	Flat	1	37⅝	.....
Traylor, C	2	Flat	2	35½	.....
Traylor, D	3	Flat	2	35½	.....
Traylor, E	4	Flat	2	37	.....
Traylor, F	5	Flat	1	32	.....
Triangle, AA	¾	Flat	1	34	.....
Triangle, A	1½	Flat	1½	43	.....
Triangle, C	2	Flat	1½	43	.....
Triangle, B	2½	Flat	1½	40	.....
Twin City, AW	3½	Flat	2	36½	.....
Twin City, BW	2	Flat	2	36¾	.....
Ultimate, A	2	Flat	2	34	.....
Ultimate, B	3	Flat	2	34	.....
Ultimate, BL	3	Flat	2	34	.....
Union, F	2½	Flat	2	37½	.....
Union, H	4	Flat	2	37½	.....
Union, J	6	Flat	2	41¼	.....
U. S., N	1½	Flat	1¼	37	.....
U. S., R	2½	Flat	1½	35	.....
U. S., S	3½	Flat	1¼	37	.....
U. S., T	5	Flat	2	38¾	.....
Velie, 46	1½	Vee	¾	41⅜	60
Vim, 27	½	Flat	1	30	.....
Vim, 29	½	Flat	1	30	.....
Vim, 31	1	Flat	1	40	.....
Vim, 22	2	Flat	1	40	.....
Vim, 23	3	Flat	.....	.....	.....
Vulcan, 25	2¼	Flat	2	30¼	.....
Vulcan, 35	3½	Flat	2	38	.....
Walker-Johnson, B	2—2½	Flat	1¼	.....	.....
Walter, S	5	Flat	1½	40	.....
Ward-LaFrance, 2B	2½	Flat	1½	42	.....
Ward-LaFrance, 4A	3½	Flat	1½	42	.....
Ward-LaFrance, 5A	5	Flat	1½	42	.....
Watson, B	1	Flat	1½	40	.....
Watson, U	5	Flat	1¼	38½	.....
White Hickory, E	1	Vee	⅝	41	60
White Hickory, H	1½	Vee	⅝	41	60
White Hickory, K	2½	Flat	1¼	33¼	.....
Wichita, K	1	Flat	1½	44⅝	.....
Wichita, L	1½	Flat	1½	44⅝	.....
Wichita, M	2	Flat	1½	44⅝	.....
Wichita, R	2½	Flat	1½	44⅝	.....
Wichita, RX	2½	Flat	1½	51⅞	.....
Wichita, O	3½	Flat	1½	51⅞	.....
Wichita, S	5	Flat	1½	51⅞	.....
Winther, 751	¾	Flat	2	36 9/16	.....
Winther, 30	1½	Flat	1¼	37½	.....
Winther, 49	2½	Flat	1¼	39½	.....
Winther, 70	3½	Flat	2	42¼	.....
Winther, 109	5	Flat	2	42¼	.....
Winther, 140	7	Flat	2	42¼	.....
Triumph, HB	2	Flat	2	32½	.....
Triumph, HC	1½	Flat	2	32	.....

The Accessory Show Case

New Fitments for the Car

Tire Valve Parts Supplied in Handy Package

A complete outfit of tire valve parts such as inside valves, "Kwik-On-An-Off" dust caps, a set of rim-nut bushings, five valve-caps, a valve-repair tool, a pump connection which permits the testing of the tire inflation without disconnecting the pump, a wrench for the tightening of hexagonal nuts at the base of the valve-stem and a Universal tire pressure gage, is contained in a handy compact case described as a Schrader Universal Tire Valve, Spare Parts and Accessory Kit, manufactured by A. Schrader's Son, Brooklyn, N. Y. The complete outfit is priced at $5.00, retail.

Grease Cup Wrench Reaches Cups Easily

The corrugated jaws of the Universal Grease Cup Wrench grips the knurled or indented tops of grease cups firmly, while the long extension handle permits of reaching into inaccessible places easily. Besides the foregoing use the tool may also be employed to open and close petcocks, be they located on the engine head, the water pump or underneath the crankcase.

Retailing at $0.65 the wrench is manufactured by the Stepanian Mfg. Co., Columbus, O.

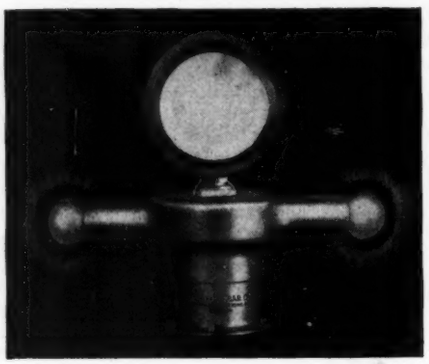
New Spark Plug Has Adjustable Intensifier

A new spark plug recently placed on the market by the Rentz Spark Plug Company, Inc., 260 Peachtree street, Atlanta, is characterized by an adjustable intensifier gap inbuilt into the plug body, and by an insulated short-circuiting switch which can be used to test the plug whenever this may be desirable.

The claim made for the intensifier is that if the plug should be fouled the intensifying gap will cause it to again resume its function and burn itself clean. As the gap is plainly visible through the plug installation, the quality of the spark can be quickly determined by visual inspection. The short circuiting switch permits of making instantaneous tests without the use of tools.

Schrader's universal tire valve and accessory kit

Aske electric vaporizer



Illuminated Bar Cap

The illuminated bar cap is designed along the lines of the ordinary bar cap, the balls at each end, however, being incandescent electric light bulbs. These can be furnished in either frosted, white, red or green colors. The wires are protected by a wall, preventing steam or water from affecting the insulation. It is made by the Automobile Engineering Co., 14 W. Washington St., Chicago.

Universal grease cup wrench

Electric Vaporizer Makes Starting Easier

The Horgan-MacDonell Co., Sales Engineers, 39 West Adams St., Chicago, are the distributors for the Aske Electric Vaporizer. This device is made up of enameled copper wire wound on a porcelain frame in such a way as to form four durable and non-clogging grids which are encased in a cover of Thermoplax, a high heat resisting compound of great mechanical strength. The whole, when placed between the carbureter and the intake manifold and charged by a carefully predetermined current of electricity, serves to heat the incoming mixture and thus make starting instantaneous, saving wear and tear on the starting battery.

It is also said that the mixture is heated to such a degree that using the choke is unnecessary. This eliminates the drawing of a raw mixture into the cylinders with the attendant evils of condensation and crankcase oil dilution. After numerous tests by some of the large automobile and truck owners, the claim was made that the device increases mileage from 20 to 50 per cent and power up to 35 per cent.

The current does not flow through the wires continuously, but after the engine is started it is switched off and the crisscross wires of the grid have the mechanical action of subdividing the fuel particles into a finely atomized state. The retail price of $10 includes all the necessary fittings, two longer carbureter bolts, seven feet of Packard cable, two self-sealing gaskets, copper cable terminals and an attractive nickelplated switch with bolts and screws for attachment to either steel or wooden instrument boards.

Rentz spark plug

Service Equipment
Time Savers for the Shop

Battery Compound Melting Pot

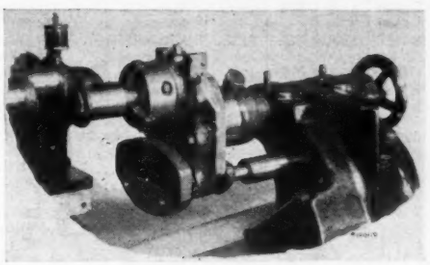
Designed to be suspended from the ceiling about 12 in. above the work bench a new compound melting pot recently placed on the market by S. R. M. Crum, 5143 Keyser street, North Philadelphia, Pa., is equipped with a needle valve in the bottom through which the compound can be flowed around the outer rims of the battery covers in a thin stream which, chilling as soon as it strikes the cold cover, does not run down into the jar as is the case when hot compound is applied in large quantities with a hand ladle.

After the initial application has had time to cool the second sealing can be applied in large quantity. The use of the pot is said to eliminate the disagreeable dripping of compound onto the bench and lead parts of the battery from which it is difficult to remove it. Priced at $3.50, the pot is designed to be heated by a portable burner.

Dynamic Balancing Is Feature of New Grinder

By an ingenious method of counterbalancing the head and tail stock, the Landis Tool Co., Waynesboro, Pa., have succeeded in developing a new grinder in which crankshafts may be refinished at high turning speed. After a crankshaft or other shaft having off-center parts is installed and centered in the machine the counterweights are added until the part can be revolved at high speed without vibration.

The crank carrying fixtures have been designed to handle crankshafts easily,



Landis grinder has dynamic balancing

and all loose attachments such as chucks, dogs, blocks and so-called throw blocks have been eliminated.

The work carrying heads are a part of the headstock and the tailstock is equipped with three jaw universal chucks, the arrangement of which is such that they can be shifted off center to a sufficient extent to accommodate any size of automobile, motor truck or tractor engine crankshaft in use. The variable center parts are moved by means of micrometer screws, and another micrometer screw fitting, located on the work rest, determines within a small fraction of a thousandth of an inch when the job is exactly centered.

It is claimed that the 24 in. grinding wheel, when driven by a 5 hp. motor, will regrind a four-throw shaft in from one to one and one-half hours, and a six-throw shaft in from one and one-half to two hours.

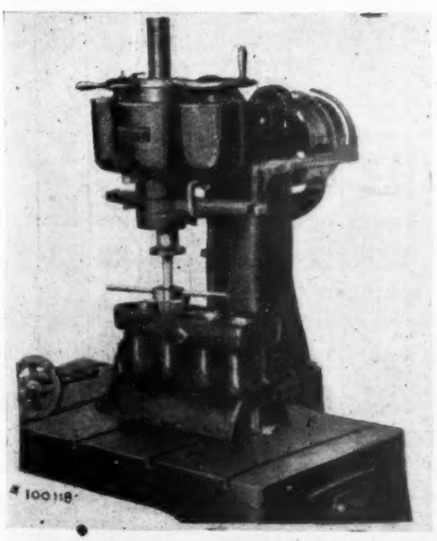
Gilfillan Bros. Portable Electric Drill

The electric drill has come to be recognized as one of the most valuable items of service station equipment. Among these is a very popular line manufactured by Gilfillan Bros., Inc., Los Angeles. The complete line is made up of six distinct units, each especially designed for some particular class of operation. Possibly the most popular of these is the type STU, as this one may be classified as an all purpose tool, it being peculiarly adapted to all kinds of high speed drilling operations. Weighing but 22½ lbs., the handy device is equipped with a Jacobs chuck and No. 3 Morse Taper Socket. The motor is of the Universal type, wound to operate satisfactorily on 110 or 220 volts A. C. or D. C. A drill stand which converts the unit from the portable to the stationary type may be had.

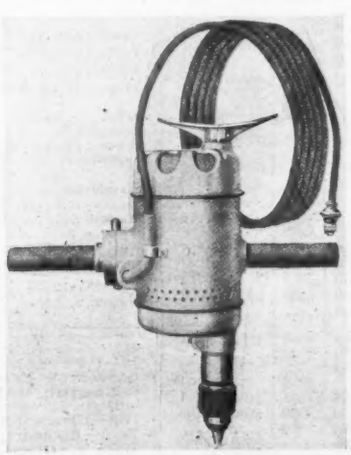
Cylinder Reboring Mill Uses Rigid Pilot Bar

Among other interesting features of the approved Power Cylinder Reboring mill manufactured by the Hinckley-Myers Co., 6 N. Michigan Ave., Chicago, are the rigid pilot bar, the method of centering the work, and the fact that the bed plate of the apparatus, being only a few inches above the floor avoids the necessity of using a hoist or tackle in placing the work.

The first named is probably the most valuable feature as the rigid bar, being supported by bearings on each end, holds the cutter head in perfect truth with the cylinder center and at exact right angles to the face of the cylinder block. After the latter has been installed on the bed plate and the pilot bar lowered through the cylinder to be ground, a novel centering fitting, which encircles the pilot bar, is forced down into the bore thus automatically centering the work. The apparatus will rebore cylinders from 2 13/16 in. to 5 in. in diameter and 20 in. in height. The time of a cut is said to average about five minutes.



Hinckley-Myers cylinder reboring mill



Gilfillan Bros. portable electric drill

New compound melting pot with needle valve

Specifications of Current Passenger Car Models

NAME AND MODEL	Engine Make	Cylinders: Bore and Stroke	WB	Tires	2-Pass.	5-Pass.	7-Pass.	Coupe	Sedan
Ace G	Guy	6-3½x5	123	32x4	$2975	$2975	....	$3680	$3680
Ace H	H-S	6-3⅝x5	123	32x4	2975	2975	....	3680	3680
Ace L	H-S	4-3½x5	116	32x4	2260	2260	....	....	....
Allen Series 43	Own	4-3½x5	110	32x4	‡1385	1385	....	....	2195
Ambassador R	Cont	6-3⅝x5¼	136	33x5	....	†4500	$4500	....	6500
American C	H-S	6-3¼x5	127	32x4	2195	2195	†2350	....	3150
Anderson Series 40	Cont	6-3¼x4½	120	33x4	2195	1795	1845	2795	2795
Apperson 8-21-S	Own	8-3¼x5	130	34x4½	....	3000	3250	4500	4500
Apperson Anniversary	Own	8-3¼x5	130	34x4½	....	3500	3750	....	....
Auburn 6-51	Cont	6-3½x4½	121	32x4	1670	1695	1760	2475	2495
Beggs 20T	Cont	6-3½x4½	120	33x4	1775	1775	....	2675	2775
Bell 4-32	H-S	4-3½x5	114	31x4	....	1495	....	....	....
Bell 6-50	H-S	6-3¼x5	124	32x4	....	1695	....	....	....
Biddle B1	Buda	4-3⅝x5½	121	32x4	3475	3475	....	....	3975
Birch Super-Four	H-S	4-3½x5	117	33x4	1195	1195	†1245	2295	1795
Birch Light Four	Lelt	4-3½x4½	108	30x3½	1045	1045	....	....	....
Birch Light Six	H-S	6-3¼x5	117	33x4	1395	1395	....	....	....
Bour-Davis 21S	Cont	6-3½x5¼	126	33x4½	†2385	†2385	2385	....	....
Brewster 91	Own	4-4 x5½	125	32x4½	†7000	7000	....	....	10500
Briscoe 4-34	Own	4-3⅜x5	109	31x4	1085	1085	....	1685	1685
Brook S-21 A	Own	2-3½x3½	90	28x3	395	....	....	....	....
Buick 1922-34-35-36-37	Own	4-3⅜x4¾	109	31x4	935	975	....	1475	1650
Buick 1922-41-5-6-7	Own	6-3⅜x4½	118	33x4§	1495	1525	....	2135	2435
Buick 1922-48-9-50	Own	6-3⅜x4½	124	34x4½	....	....	1735	2325	2635
Bush E.C.4	Lyc	4-3½x5	116	33x4	....	1195	....	....	....
Bush E.C 6	Rut	6-3½x5	116	33x4	....	1345	....	1750	1850
			125	34x4½	3790	†3790	....	....	4950
Cadillac 59	Own	8-3½x5½	132	35x5	....	....	3940	....	5190
Carroll C	Roch	6-3½x5	128	32x4½	3185	3185	....	....	....
Carroll V	Cont	6-3½x5¼	126	34x4½	....	‡2250	2250	2900	3285
Case 6-30	Own	6-3¼x4½	117	32x4	1495	1545	....	2295	2445
Chalmers 6-30	Own	6-3¼x4½	122	33x4½	....	....	1795	....	....
Champion Tourist	Lyc	4-3½x5	113	32x3½	....	1095	....	....	....
Champion Special	H-S	4-3½x5	118	32x4	†1395	1395	....	....	....
Chandler Six	Own	6-3½x5	123	33x4	1785	†1785	1785	2785	2885
Chevrolet 490	Own	4-3½x4	102	30x3½	625	625	....	975	975
Chevrolet FB	Own	4-3½x5¼	110	33x4	975	975	....	1575	1575
Cleveland 40	Own	6-3 x4½	112	32x4	1295	1295	....	2195	2295
Climber Four	H-S	4-3½x5	115	33x4	1450	1385	....	....	....
Climber Six S	H-S	6-3½x5	125½	32x4½	2250	2250	....	....	....
Colo 870	Nort	8-3½x4½	127	33x5	2550	†2695	2795	3695	3995
Columbia Challenger	Rut	6-3½x5	115	32x4	....	1195	....	†1995	1995
Columbia D-C&CS	Cont	6-3¼x4½	115	32x4	1475	1475	....	†2295	2350
Comet C-53	Cont	6-3½x5¼	125	33x4½	....	2350	2450	....	3650
Commonwealth 44	H-S	4-3½x5	117	32x4	....	1395	....	....	2465
Crawford 21-6-40	Cont	6-3½x5¼	122½	32x4	3000	3000	3000	....	4500
Crow-Elkhart L63-65	Lyc	4-3½x5	117	32x3½	‡1295	1295	....	....	....
Crow-Elkhart S63-65	H-S	6-3¼x5	117	33x4	‡1545	1545	....	....	2395
Daniels D-19	Own	8-3½x5½	132	34x4½	‡5350	†5350	5350	6250	6950
Davis 61-67	Cont	6-3¼x4½	120	32x4	†1995	1895	†2150	2795	2795
Dispatch	Wisc	4-3⅜x5	120	34x4	1250	1350	1350	1525	1575
Dixie Flyer H-S-10	H-S	4-3½x5	112	32x4	1445	1445	....	2295	2345
Dodge Brothers	Own	4-3⅞x4½	114	32x4	935	985	....	1585	1785
Derris 6-80	Own	6-4 x5	132	33x5	....	†4785	4785	5800	6690
Dort 17-12	D-Ly	4-3½x5	108	31x4	985	985	....	1535	1685
Driggs	Own	4-3½x4½	104	30x3½	1275	1275	....	....	1975
Duesenberg	Own	8-2⅞x5	128½	33x5	5600	5600	....	....	7500
Dupont A	Own	4-3½x5½	124	32x4½	3400	†3400	....	....	4900
Durant A-22	Cont	4-3⅞x4¼	109	31x4	....	890	....	1365	1365
Elcar K-4	Lyc	4-3½x5	117	33x4	1195	1195	....	....	....
Elcar 7-R	Cont	6-3¼x4½	117	33x4	†1595	1595	‡1195	2395	2495
Elgin K-1	Falls	6-3½x4¼	118	33x4	1595	1495	†1595	2395	2395
Essex	Own	4-3⅜x5	108½	32x4	1445	1445	....	1950	2300
Fergus S-5-21	Own	6-3½x5	126	33x4½	....	Chassis	Price	8500	....
Ferris C-2c	Cont	6-3½x5¼	130	32x4½	2695	....	*2595	....	3675
Ford T	Own	4-3⅜x4	100	30x3½	**370	††415	....	605	760
Franklin 9-B	Own	6-3¼x4	115	32x4	2550	2650	†2550	....	3650
Friend Four	Own	4-3¼x4½	112	32x3½	‡1285	1285	....	1985	2085
Gardner G	Lyc	4-3½x5	112	32x3½	‡995	‡995	....	....	1795
Grant Six	Own	6-3½x4½	116	32x4	1550	1550	....	2450	2450
H.C.S	Weid	4-3⅝x5½	120	32x4½	2725	†2775	....	3450	3650
Halladay, Manh. Special	Rut	6-3½x5	118	33x4	....	1695	....	....	....
Halladay, Craft Special	Rut	6-3½x5	123	33x4	....	2295	....	....	....
Handley-Knight	Kn'ht	4-4½x4½	125	32x4½	....	....	2850	....	4185
Hanson Six 60	Cont	6-3¼x4½	121	32x4	1795	1795	1895	†2775	2885
Harroun A-A-2	Own	4-3¼x5¼	106	30x3½	....	1195	....	....	....
Hatfield A-42	H-S	4-3½x5	115	32x4	1495	1495	....	....	2395
Haynes 75	Own	6-3½x5⅜	132	34x4½	2685	2485	2485	3185	3485
Haynes 55	Own	6-3½x5	121	33x4	1835	1785	....	....	2835
Haynes 48	Own	12-2⅞x5	132	34x4½	4200	3635	3635	4650	4950
Holmes Series 4	Own	6-3½x4¼	126	34x4½	†2950	....	2950	3850	4150
Hudson Super 6	Own	6-3½x5	126	34x4½	†2250	....	2250	3125	3250
Huffman R	Cont	6-3¼x4½	120	32x4	1845	1795	....	....	2775
Hupmobile Series R	Own	4-3¼x5½	112	32x4	1485	1485	....	2400	2485
Jackson 63B	Cont	6-3¼x4½	121	32x4½	†2685	1950	....	3760	3760
Jordan M	Cont	6-3¼x4½	120	32x4	2250	2250	....	3300	3300
Jordan F	Cont	6-3½x5¼	127	32x4½	....	....	2475	....	3700
Kenworthy 8-90	Own	8-3 x5¼	130	32x4½	5000	5000	5250	6000	6000
Kessler K	Own	4-3⅝x3⅝	117	32x4	....	1995	....	....	2445
King J	Own	8-3 x5	120	32x4½	2740	†2725	*2725	....	4035
Kissel 45	Own	6-3⅛x5½	124	32x4½	2975	†2975	2475	†3775	*3775
Kline Kar 6-55-K	Cont	6-3½x4½	121	33x4	2090	2090	2090	3250	3290
Kurtz Automatic A	H-S	6-3¼x5	122	32x4	....	2050	....	....	3000
LaFayette 134	Own	8-3¼x5½	132	33x5	4850	4850	4850	6250	6500
Leach 21-A-B&C	Cont	6-3½x5¼	128	32x4½	§5700	5200	5700	....	....
Lexington Series S	Cont	6-3¼x4½	122	32x4	....	1885	....	2750	3150
Lexington Series T	Anst	6-3¼x4½	128	32x4½	....	....	2785	....	4150
Liberty 10-C	Own	6-3½x5	117	32x4	1595	1595	†1675	2400	2495
Lincoln	Own	8-3⅜x5	130	33x5	4300	4300	4300	4950	5400
Locomobile	Own	6-4½x5½	142	35x5	....	†8600	8600	....	....
Lorraine 21-T	H-S	4-3½x5	114	32x4	1665	1665	....	2590	2590

NAME AND MODEL	Engine Make	Cylinders: Bore and Stroke	WB	Tires	2-Pass.	5-Pass.	7-Pass.	Coupe	Sedan
Maibohm B	Falls	6-3⅛x4¼	116	32x4	‡1575	$1575	†1750	$2395	$2395
Marmon 34	Own	6-3⅜x5½	136	32x4½	4185	†3985	3985	4875	5275
Maxwell 25	Own	4-3⅝x4½	109	30x3½	845	845	....	1445	1545
McFarlan 1921	Own	6-4½x6	140	33x5	6300	†6300	6300	7500	7500
Mercer Series 5	Own	4-3¾x6¾	132	32x4½	4500	†4500	*4500	5700	6200
Merit	Cont	6-3¼x4½	119	32x4	2245	†2245	....	....	....
Meteor R&RR	Dues	4-4¼x6	129	32x4½	5500	5500	....	....	....
Metz M6	Rut	6-3½x5	120	32x4	1995	1995	....	2795	2895
Mitchell F-40	Own	6-3¼x5	120	33x4	‡1490	1490	....	2590	2690
Mitchell F-42	Own	6-3½x5	127	33x4	....	....	1795	....	....
Moller A	Own	4-2¾x4	100	27x3½	2000	....	....	....	....
Monroe S-9 & 10	Own	4-3¼x4½	115	32x3½	1295	1295	....	....	....
Monroe S-11 & 12	Own	4-3¼x4½	115	33x4	....	....	....	2075	2175
Moon 6-48	Cont	6-3¼x4½	122	32x4	2085	1985	2485	2985	2985
Moon 6-68	Cont	6-3½x5¼	125	32x4½	....	....	2485	3485	3485
Murray-Mac Six	Own	6-3½x5¼	128	34x4½	4250	4250	4250	....	....
Nash 681-7	Own	6-3¼x5	121	33x4	1525	1545	†1695	2395	2695
Nash 682	Own	6-3¼x5	127	34x4½	....	....	1695	....	....
Nash Four 41-4	Own	4-3¼x5	112	32x3½	1175	1195	....	1735	1935
National Sextet BB	Own	6-3½x5¼	130	32x4½	2990	†2990	2990	3990	3990
Nelson D	Own	4-3½x4¾	104	32x4	....	1900	....	....	....
Noma 1C	Cont	6-3¼x4½	128	32x4½	3000	†3200	....	....	4450
Northway	Own	6-3½x5¼	128	33x5	4200	*4200	6000	5600	5400
Norwalk 430-KS	Lyc	4-3½x5	116	32x3½	....	1035	....	....	....
Oakland 34-C	Own	6-2⅞x4¾	115	32x4	1095	1145	....	1625	1725
Ogren 6-60	Own	6-3½x5¼	134	33x5	†3850	3750	3900	5000	5100
Oldsmobile 43-A	Own	4-3⅛x5¼	115	32x4	†1325	1345	....	1895	2100
Oldsmobile 37A	Own	6-2⅞x4¾	112	32x4	†1450	1450	....	2145	2145
Oldsmobile 46	Own	8 2⅞x4¾	122	33x4½	....	†1825	1875	....	2775
Oldsmobile 47	Own	8-2⅞x4½	115	32x4	....	†1725	....	2225	2425
Overland 4	Own	4-3⅜x4	100	30x3½	695	695	....	1000	1275
Packard Single-Six	Own	6-3⅜x4½	116	33x4½	2975	2975	....	3750	3975
Packard Twin Six	Own	12-3 x5	136	35x5	4850	*4850	4850	6600	6800
Paige 6-42	Own	6-3¼x5	119	32x4	1635	1635	....	2450	2570
Paige 6-66	Cont	6-3⅜x5	131	33x4½	†2975	†3295	2875	3755	3830
Pan American E&F-6-55	H-S	6-3¼x5	121	33x4	2000	2000	2100	....	....
Parenti 1921	Own	8-2⅞x4¼	125	32x4	....	2000	....	....	3000
Paterson 650	Cont	6-3¼x4½	120	33x4	....	1595	1625	2895	2895
Peerless 56-S-7	Own	8-3¼x5	125	34x4½	....	†2990	2990	3680	3950
Peters	Own	2-3½x3⅜	90	28x3	385	....	....	....	....
Piedmont 4-30	Lyc	4-3½x5	116	32x3½	....	1270	....	....	....
Piedmont 6-40	Cont	6-3¼x4½	122	32x4	....	1495	....	....	....
Pierce-Arrow	Own	6-4 x5½	138	33x5	7000	†6500	6500	8000	8500
Pilot 6-45	Tector	6-3⅜x5	120	32x4	1945	1895	....	....	....
Pilot 6-59	H-S	6-3¼x5	126	32x4½	2285	2285	2335	3350	3400
Porter 40	Own	4 4⅜x6¾	142	35x5	6750	(Chassis	Price	....	....
Premier 6-D	Own	6 3⅜x5½	126¾	33x5	3790	†3690	3890	4690	5190
Premocar 6-40 A	Falls	6-3½x4¼	117	33x4	1295	1295	....	....	....
Raleigh A-6-60	H-S	6-3¼x5	122	32x4½	2250	2250	....	3100	3200
R & V Knight R	Own	4-3¾x5	116	32x4	....	2150	....	2850	2950
R & V Knight J	Own	6-3½x4½	127	32x4½	3350	†3350	3350	4000	4200
Reo T-6	Own	6-3½ x5	120	33x4	1650	1650	....	2700	2750
Revere C	Dues	4 4½x6	131	32x4½	4850	4650	†4650	....	6500
Roamer 6-54-E	Cont	6-3½x5¼	128	32x4½	3150	†3150	3250	†3985	†4100
Roamer 4-75-E	Dues	4-4¼x6	128	32x4½	4150	3985	....	....	....
Rolls-Royce	Own	6 4½x4¾	143½	33x5	U. S	(Chassis	Price	11750	....
Romer	Cont	6-3¼x4½	120	32x4	2000	2000	2100	2450	2750
Saxon 125	Own	4-3½x5	112	32x4	1545	1495	....	2295	2295
Sayers Six DP	Cont	6-3¼x4½	118	33x4	2145	1945	....	....	2995
Scripps-Booth B-39-42	Nort	6-2⅞x4¾	115	32x4	‡1275	1295	....	1950	2100
Scripps-Booth F-43-46	Cont	6-3¼x4½	115	32x4	1470	1490	....	2350	2375
Seneca L & O	LeR	4-3½x4½	108	30x3½	1045	1045	....	....	....
Severin Six	Cont	6-3½x5¼	122½	33x4½	1485	1485	....	2100	2250
Severin Six	Cont	6-3½x5¼	122½	33x5	2550	2550	2550	3250	3350
Skelton 35	Lyc	4-3½x5	112	32x3½	995	995	....	....	....
Southern Six 660-2	H-S	6-3¼x5	127	32x4½	2875	2875	2995	....	....
Standard J	Own	8-3¾x5	127	34x4½	3400	†3400	3400	4500	4800
Stanley Steamer	Own	2-4 x5	130	34x4½	2800	2600	2600	3775	3850
Stanwood Six	Cont	6-3¼x4½	118	33x4	2050	2050	....	2950	....
Stearns SKL4	Own	4-3⅞x5⅝	125	34x4½	2550	2450	2675	3400	3700
Stephens 90	Own	6-3¼x4½	122	33x4½	1900	†1985	2065	3100	3100
Stevens Duryea E	Own	6-4⅛x5½	138	35x5	8500	†8000	8000	9500	9500
Studebaker EJ-40	Own	6-3⅝x4½	112	32x4	1300	1335	....	1695	1995
Studebaker EH-50	Own	6-3½x5	119	32x4	1585	1635	†1635	2450	2550
Studebaker EG-60	Own	6-3⅞x5	126	33x4½	....	....	1985	....	....
Stutz	Own	4-4⅝x6	130	32x4½	3250	†3350	*3350	4800	....
Templar A-445	Own	4-3⅜x5½	118	32x4	2385	2385	....	3185	3185
Texan A-38	Lyc	4-3½x5	115	33x4	1195	1195	....	....	....
Texan C-12	H-S	4-3½x5	115	33x4	1350	1350	....	....	....
Tulsa E-1-2-3	H-S	4-3½x5	117	33x4	1285	1285	....	....	....
Velie 48	Cont	6-3¼x4½	115	32x4	1585	1585	†1800	2485	2485
Velie 34	Falls	6-3⅛x4¼	112	32x3½	1385	1385	....	....	2085
Vogue 6-55	H-S	6-3¼x5	124	32x4	....	1885	1960	2785	2885
Vogue 6-66	Cont	6-3½x5¼	124	33x4½	....	2085	2160	2885	2985
Washington	Falls	6-3½x4¾	116	32x4	....	1685	....	....	....
Westcott C-48	Cont	6-3½x5¼	125	32x4½	....	....	2990	....	4590
Westcott C-38	Cont	6-3¼x4½	118	33x4	2290	2290	†2290	3390	3390
Wharton A	Curt	8-4 x5	136	34x4½	....	†4885	4885	....	....
Wills Sainte Claire	Own	8-3¼x4	121	32x4½	2875	2875	....	3750	4100
Willys-Knight 20	Own	4-3⅝x4½	118	33x4	1895	1895	....	2550	2750
Winther 61	H-S	6-3¼x5	120	32x4½	....	....	2750	....	....
Winton 25	Own	6-3¾x5¼	132	35x5	4600	†4975	4600	5950	†5950

*—6-passenger. †—4-passenger. ‡—3-passenger. **—Price without starter and demountable rims. Price with starter and demountable rims $465. ††—Price without starter and demountable rims. Price with starter and demountable rims $510.

Engine Make: Anst.—Ansted. Cont—Continental. Curt—Curtiss. D.Ly—Dort Lycoming. Dues.—Duesenberg. GBS—Golden, Belknap & Swartz. H-S—Herschell-Spillman. LeR—Leroi. Lyc—Lycoming. Nort—Northway. Roch—Rochester. Rut—Rutenberg. Supr—Supreme. Tec—Teetor. Weid—Weidely. Wisc—Wisconsin. §Model 47—34 x 4½ Tires.

Specifications of Current Motor Truck Models

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Acason	¾	$1650§	3¾x5	34x5†	34x5†	W
Acason, R	1	2260	3¾x5½	36x3½	36x5	W
Acason, RB	1½	2485	3¾x5¼	36x3½	36x6	W
Acason, H	2½	3295	4⅜x5¾	36x4*	36x4d*	W
Acason, L	3½	4295	4⅜x5¾	36x5*	36x5d*	W
Acason, M	5	5250	5 x6¼	36x6	40x12	W
Ace, C	1½	2295	3¾x5½	34x3½*	34x5*	W
Ace, A	2½	2795	4¼x5½	36x4*	36x7	W
Acme, G	¾	....	3¾x5	35x5†	35x5†	W
Acme, B	1	....	3¾x5	34x3½	34x5	W
Acme, F	1½	....	3¾x5	34x3½	34x5	W
Acme, A	2	....	4⅛x5¼	36x4	36x7	W
Acme, AC	2½	....	4½x5½	36x4	36x7*	W
Acme, C	3½	....	4½x5½	36x5	40x10	W
Acme, E	5	....	4¾x6	36x6	40x12	W
Akr'nMulti-Trk	20 1	1995	4 x5¼	34x5	34x5	B
All-Power, C	3½	5800	4½x6	36x7	36x10	W
All-American, B-1	1	1795	3½x5	32x4	32x4	I
All-American C-1	1½	2195	3½x5	34x4	34x5	I
American, 25	2½	3350	4 x6	36x4*	36x4d*	W
American, 40	4	4275	4½x6	36x5*	36x5d*	W
Apex, G	1	1450††	3½x5	33x5†	33x5†	I
Apex, D	1½	1915	3¾x5½	34x3½	34x4	I
Apex, E	2½	2695	4¼x5½	36x4	36x7	I
Apex, F	3½	3975	4½x6	36x5	36x10	I
Armleder, 20	1	....	3¾x5¼	34x3½*	34x5*	W
Armleder, HW	2½	....	4¼x5½	36x4*	36x7*	W
Armleder, KW	3½	....	4½x6	36x5	36x5d	W
Atco, B	1½	....	3¾x5¼	34x5†	36x6*	I
Atco, B1	1½	....	3¾x5¼	34x5†	36x6†	I
Atco, A	2½	....	4¼x5½	36x4†	36x8*	W
Atlas, M.D	1	....	3½x5	32x4½†	32x4½†	W
Atterbury, 20R	1½	2775	3¾x5	34x3½	34x5	W
Atterbury, 7CX	2½	3375	4⅛x5¼	36x4	36x4d	W
Atterbury, 7D	3½	4175	4½x5½	36x5	40x5d	W
Atterbury, 8E	5	5575	4¾x6	36x5	40x6d	W
Autocar, 21UF	1½-2	2300	4¾x4½	34x4*	34x5*	D
Autocar, 21UG	1½-2	2400	4¾x4½	34x4*	34x5*	D
Autocar, 26Y	...	4350	4¼x5½	34x5	36x10	D
Autocar, 26-B	...	4500	4¼x5½	34x5	36x10	D
Available, H1	1½	2475	4 x5½	36x3½*	36x5*	W
Available, H2	2	2775	4 x5½	36x3½*	36x6*	W
Available, H2	2½	3475	4 x5½	36x4*	36x8*	W
Available, H3	3½	4475	4½x5½	36x5	40x5d	W
Available, H5	5	5375	4¾x6	36x6	40x12	W
Available, H7	7	6000	5 x6	36x6	40x14	B
Avery	1	....	3 x4	34x5†	34x5†	I
Beck, A. Jr.	1	1800	3¾x5	34x3½	34x4	I
Beck, C	2	2550	4½x5½	36x4	36x6	I
Bell, M	1	1650	3⅝x5⅛	35x5	35x5†	I
Bell, E	1½	2250	3¾x5¼	34x3½	34x5†	I
Bell, O	2½	2750	4¼x5½	34x4	34x6	I
Belmont, D	2	2675	3¾x5	34x3½*	34x6*	D
Belmont, F	3½	3525	4 x6	36x5*	36x5d*	D
Bessemer, G	1	1395	3½x5	35x5†	35x5†	I
Bessemer, H-2	1½	1995	3¾x5	36x3½	36x5	I
Bessemer, J-2	2½	2595	4⅛x5¼	36x4	36x4d	I
Bessemer, K-2	4	3495	4½x5½	36x5	36x10	I
Bethlehem, K	1	....	3½x5	34x4½†	35x5	I
Bethlehem, G	2	....	4 x5¼	34x3½*	34x6*	I
Bethlehem, H	3	....	4 x5¼	36x4*	36x8	I
Bethlehem, J	4	....	4½x5½	36x5*	36x5d*	I
Bollstrom, 30	1½	2100	3¾x5¼	34x3½	34x6	I
Bollstrom, 50	2½	2800	4¼x5½	36x4	36x8	I
Bollstrom, 70	3½	3800	4½x6	36x5	36x10	I
Bollstrom, A-20	4	6000	5¾x7	40x8†	40x8†	I
Bollstrom, B21	4	5050	4½x5½	36x7	36x7	I
Bridgeport, A	1½	2350	3¾x5¼	34x3	34x6	W
Bridgeport, B	2½	2850	4¼x5½	36x4*	36x7*	W
Bridgeport, C	3½	3850	4½x6	36x5	36x5d	W
Brinton, F	2½	3400	4½x5¼	36x4	36x7	W
Brockway, E	¾	1675	3⅛x5⅛	35x5†	35x5†	B
Brockway, S-4	1½	2250	3¾x5	36x3½*	36x5*	W
Brockway, K-5	2½	3200	4½x5½	36x4	36x8	W
Brockway, R-4	3½	4100	4½x5½	36x5	36x5d	W
Brockway, T	5	4750	4¾x6	36x6	40x6d	W
Capitol, G1	1½	2975	3¾x5	35x5	38x7	W
Capitol, H2	2½	3700	4¼x6	36x4	36x8	W
Capitol, K2	2½	4250	4¼x6	36x6	42x9	W
Capitol, M3	3½	4425	4¼x6	36x5	36x10	W
Case, ††	2	3000	4¼x5¾	36x6	38x7	I
Champion Light Commercial	½	1195	3½x5	32x3½	32x3½	I
Chevrolet, G	¾	820	3⅛x4	31x4†	34x4½†	B
Chevrolet, T	1	1225	3⅛x5¼	33x4†	35x5†	W
Chicago, C1	1½	....	3¾x5⅛	36x3½*	36x5*	W
Chicago, C2	2½	....	4 x5⅛	36x4*	36x7*	W
Chicago, C3	3½	....	4½x5½	36x5	36x10	W
Chicago, D5	5	....	4½x5½	36x6	40x12	W
Climber, A 20	1½	2450	3½x5	36x6*	38x7*	I
Clydesdale, 18	¾	1890	3¾x5	34x5	34x5	W
Clydesdale, 32C	1	2375	3¾x5¼	34x3½*	34x5*	W
Clydesdale, 42C	1½	2475	4 x5⅛	36x3½	36x5	W
Clydesdale, 65C	2½	3250	4¼x5½	36x4	36x7	W
Clydesdale, 65EC	2½	3450	4½x5½	36x4	36x7	W
Clydesdale, 90C	3½	4100	4½x5½	36x5	40x10	W
Clydesdale, 120C	5	4500	4¾x6	36x6	40x12	W
Collier, 18	1	2350	3¾x5	34x4	34x5	W
Collier, 19	1½	2550	3¾x5	36x4	36x6	W
Collier, 21	2	2950	4⅛x5¼	36x4	36x7	W
Collier, 22	2½	3250	4⅛x5¼	36x4	36x4	W
Columbia, H	1½	2350	3¾x5	35x5†	34x5	I
Columbia, G	2½	2850	4 x5¼	36x4	36x7	I
Comet	1½	1950	3¾x5	34x4	34x4	W
Commerce, T	¾-1¼	1450	3¾x5	34x4½†	34x4½†	B
Commerce, 12	1½	1800	3¾x5	35x5†	35x5†	I
Commerce, 16	2	2150	3¾x5	35x5†	35x6†	I
Concord, A	1½	3150	4 x5½	36x3½	36x6	W
Concord B	2½	3600	4¼x5½	36x4	36x8	W
Concord AX	1½	$3250	4 x5½	36x3½	36x6	W
Concord, BX	2½	3600	4½x5½	36x4	36x8	W
Cook, 41	2	3000	4 x5½	36x6†	38x7†	I
Corbitt, E	1	2200	3¾x5	34x3½	34x4	W
Corbitt, D	1½	2600	3¾x5	36x3½	36x5	W
Corbitt, C	2	3150	4⅛x5¼	36x3½	36x7	W
Corbitt, B	2½	3300	4⅛x5¼	36x4	36x7	W
Corbitt, A	3½	4100	4½x5½	36x5	36x10	W
Corbitt, AA	5	5000	4¾x6	36x6	40x6d	W
Cyclone A	1½	2685§	3½x5	34x5†	36x6†	I
Dart, S	1½	....	3¾x5½	34x3½	34x6	W
Dart, M	2½	....	4¼x5½	36x4	36x7	W
Dart, W	3½	....	4½x6	36x5	36x10	W
Day-Elder, A	1	2100	3¾x5	34x3½	34x4	W
Day-Elder, B	1½	2300	3¾x5	34x3½	34x5	W
Day-Elder, D	2	2750	4½x5½	36x4	36x7	W
Day-Elder, C	2½	3025	4½x5½	36x4	36x7	W
Day-Elder, F	3½	3750	4½x5½	36x5	36x5d	W
Day-Elder, E	5	4250	4½x6	36x5*	40x6d*	W
Dearborn, F	1½	2180	3¾x5½	34x4*	34x5*	W
Dearborn, 48	2	2590	3¾x5⅛	35x5†	34x7†	W
Defiance, G	1	1975	3¾x5	35x5†	35x5†	I
Defiance, D	1½	2550	3¾x5	35x5†	36x6†	I
Defiance, E	2	2750	3¾x5	35x5†	38x7†	I
DeKalb, E2	2	2600	4¼x5¼	36x4*	36x6*	W
DeKalb, E2	2½	2250	4¼x5¼	34x3½*	36x5*	W
De Martini 1	1½	2600	3¾x5	34x3½	34x6	W
DeMartini 2	2	3300	4 x5½	36x3½	36x7	W
DeMartini 3	3	4250	4¼x5½	36x4	36x10	W
DeMartini 4	4	4800	4½x6	36x5	36x12	W
Denby, 12	1	1625	3¾x5	35x5	36x6	I
Denby, 33	1½	2300	3¾x5	35x5†	38x7†	I
Denby, 134	2	2600	3¾x5	36x3½	36x6	I
Denby, 25	3	3300	4¼x5¼	36x4	36x7	I
Denby, 27	4	4200	4½x5½	36x5	36x5d	I
Denby, 210	5	4850	4½x5½	36x6	40x6d	I
Dependable, A	¾-1	1650	3⅝x5⅛	34x5	36x6	W
Dependable, C	1½	2350	3¾x5¼	34x3½	34x5	W
Dependable, D	2	2650	4 x5½	34x5	36x6	W
Dependable, E	2½	2950	4¼x5½	36x4	36x7	W
Dependable, G	3½	3550	4½x6	36x6	38x7	W
Diamond-T, O	1	2500	3¾x5¼	34x5†	36x6†	W
Diamond-T, FS	1½	2960	3¾x5¼	36x3½	36x5	W
Diamond-T, T	1½	2650	3¾x5¼	36x3½	36x5	W
Diamond-T, U	2	3285	4 x5¼	36x4	36x7	W
Diamond-T, K	3½	4675	4¼x5½	36x5	36x5d	W
Diamond-T, EL	5	5400	4½x5½	36x6	40x6d	W
Diamond-T, S	5	5650	4¾x6	36x6	40x6d	W
Diehl, A	1	....	3½x5	34x4½	35x5	I
Diehl, B	1½	....	3½x5	36x6	36x6	I
Dispatch, F	1	1350	3¾x5	34x4†	34x4†	I
Doane	2½	4100††	4¼x5¾	36x5	36x7	C
Doane	3½	5100††	4¾x5¾	36x5	36x5d	C
Doane	6	6000††	4¾x6¾	36x6	40x6d	C
Dodge Brothers	½	885	3⅞x4½	33x4†	33x4†	B
Dorris, K-4	2-2½	3400	4¼x5½	36x4	36x7	W
Dorris, K-7	3½	4400	4½x5½	36x5	36x10	W
Double Drive B	3	4000	4¼x5½	6	6	W
Douglas G	1½	2050	3¾x5⅛	36x5	37x8*	W
Douglas I	3	3250	4¼x5½	36x6	37x8*	W
Duplex, A	1½	2775	4 x5¼	35x5†	38x7†	W
Duplex, E	3½	4250	4¼x5½	36x8	36x8	I
Duty, 21	1	1490	3½x5	34x3½	34x5	I
Eagle, 100-2	2	2275	3¾x5¼	34x4*	34x7*	I
Erie, A	2½	....	4¼x5½	36x4	36x4d	W
F.W.D., B	1	4200	4¾x5½	36x6	36x6	B
Facto, 1921	2½	2895§	4¼x5½	36x4*	36x8*	W
Fageol, 1½	1½	3000	3¾x5¼	34x3½*	34x6*	W
Fageol, 2½	2½	3900	4¼x5¾	34x4	36x7	W
Fageol, 3½	3½	5000	4½x6¼	36x5*	40x5d*	W
Fageol, 5	5	5700	4½x6¼	36x6	40x6d	W
Famous, B10	1	1800	3¾x5	36x3½*	36x4*	I
Famous, B12	1½	2100	3¾x5	36x3½*	36x5*	I
Fargo, R	2	2500	3¾x5	36x4	36x6	I
Federal, SD	1	2500	3¾x5	35x5†	36x6†	W
Federal, TE	1½	2725	4¼x5¼	36x3½	36x5	W
Federal, UE	2	3025	4¼x5¼	36x4	36x7	W
Federal, WE	3½	3950	4½x5½	36x5	36x5d	W
Federal, X 2	5-6	5350	4¾x6	36x6	40x6d	W
Ford, TT	1	495	3¾x4	30x3½*	32x4½*	W
Forschler, A	1	....	3½x5	34x3	34x4	W
Forschler, AX	1½	....	3½x5	36x3½	36x5	W
Forschler, B	2	....	4¼x5¼	36x4	36x7	W
Forschler, BX	3	....	4¼x5¾	36x4	36x8	W
Front Drive C	1½	2800	3¾x5½	5	4	W
Fulton, A	¾	1750	3½x5	35x5†	35x5†	B
Fulton, C	2	2350	3½x5	34x4	34x6	I
G & J**	2	3850	4x5¼	36x4	36x7	W
G & J**	3½	5175	4½x5½	36x5	36x5d	W
G.M.C., K15	¾	....	3½x5½	33x4½†	33x4½†	B
G.M.C., K16	1	1495	3½x5½	34x5†	34x5†	B
G.M.C., K41	2	3000	4 x5½	36x4*	36x7*	W
G.M.C., K71	3½	4250	4½x6	36x5	40x5d	W
G M.C.,K101	5	4650	4½x6	36x5	40x6d	W
G.W.W.	1½	2100	3¾x5½	35x5	35x5	I
Garford, 15	¾	1590	3⅞x5⅛	34x5†	34x5†	W
Garford, 25	1¼	2090	3¾x5⅛	36x3½	36x4	W
Garford, 70-H	2	3190	4¼x5½	36x4	36x7	W
Garford, 68D	5	5200	5 x6½	36x6	40x6d	W
Garford, 77D	3½	4390	4½x6	36x5	36x6d	W
Garford, 150-A	7½	5500	5x6½	36x6	40x7d	C
Gary, F	1	$2100	3¾x5	36x3½	36x4	W
Gary, I	1¼	2550	4 x5½	36x3½	36x5	W
Gary, J	2½	3150	4¼x5½	36x4	36x7	W
Gary, K	3½	4050	4½x6	36x5	40x5d	W
Gary, M	5	5150	5 x6½	36x6	40x6d	W
Gersix M	1½	3100	4 x5½	36x3½	36x7	W
Gersix K	2½	3500	4½x5½	36x4	36x8	W
Gersix	3½	4500	4½x6	36x5	40x12	W
Giant, 15-A	1½	2250	3¾x5	34x3½	34x5	W
Giant, 16	2	3050	4⅛x5¼	36x4	36x7	W
Giant, 17	3½	4150	4½x5½	36x5	36x5d	W
Globe D-20	¾	1495	3⅜x5	33x4½†	33x4½†	B
Globe	1	1495	3⅜x5	33x5	33x5	B
Golden West, GH	3	5000	4½x6	36x7	36x7	W
Golden West, G	3½	4500	4½x5½	36x6	36x6	W
Golden West, H	3½-4	5000	4½x6	36x6	36x6	W
Golden West, T	4	5500	4¾x6	36x6	36x6	W
Golden West, K	7	6000	5½x6	36x6	36x6	W
Golden West, HA	7	6000	4½x6	36x6	36x10	W
Gove, A-1	2½	....	4⅛x5¼	36x4*	36x7*	I
Graham Bros. A	1½	2495	3¾x5	35x5†	36x6†	I
Gramm-Bern., 10	1	1495§	3½x5	33x5†	33x5†	B
Gramm-Bern., 15	1½	2050§	3¾x5	36x3½*	36x5*	I
Gramm-Bern., 65	1½	2725§	3¾x5	36x3½*	36x5	W
Gramm-Bern., 20	2	3175§	4½x5½	36x4*	36x7*	W
Gramm-Bern., 25	2½	3575§	4¼x5½	36x4*	36x4d*	W
Gramm-Bern., 35	3½	4375§	4½x5½	36x5	40x5d*	W
Gramm-Bern., 50	5	5275§	4¾x6	36x6	40x6d*	W
Hahn, J4	1	....	3¾x5	34x5*	34x5*	W
Hahn, CD	1½	....	4⅛x5¼	36x3½*	36x6*	W
Hahn, EE	2½	....	4½x5½	36x4*	36x8*	W
Hahn, F	3½	....	4½x5½	36x5*	36x10*	W
Hahn, EF	5	....	4¾x6	36x6	40x12	W
Hal Fur, E	1	2350	4 x5	35x5†	35x5†	W
Hal Fur, B	2½	3250	4¼x5½	35x5*	38x7*	W
Hal Fur, F	3½	4250	4½x5½	36x6†	40x10†	W
Hall	1½	3100	3¾x5	34x5†	38x7†	W
Hall	2½	3275	4⅛x5¼	36x4	36x6	W
Hall	3½	4100	4½x5½	36x5	36x5d	W
Hall	5	5100	4½x5½	36x5	40x6d	W
Hall	7	5100	4½x5½	36x5	40x6d	C
Harvey, WEA	1½	2550	4⅛x5½	34x3½	34x5	W
Harvey, WFA	2½	3300	4¼x5½	36x4	36x7	W
Harvey, WHA	3½	4300	4½x6	36x5	36x5d	W
Harvey, WKA	5	5200	4½x6	36x6	40x6d	W
Hawkeye, K	1½	1850	3¾x5¼	34x3½*	34x5*	I
Hawkeye, M	2	2650	4¼x5½	36x4*	36x6*	I
Hawkeye, N	3½	3700	4½x6	36x5*	36x10*	I
Hendrickson, N	2½	3150	4¼x5¾	36x4*	36x7*	W
Hendrickson, M	3½	3975	4¼x5¾	36x5*	36x5d*	W
Highway, Knight A	4	....	4 x6	36x5	36x6d	W
Highway, Knight B	5	....	4 x6	36x5	40x6d	W
Higrade, A17	¾	1850	3½x5	32x4½	32x4½	W
Higrade, A18	1	2100	3½x5	35x5†	35x5†	W
Higrade, B20	1½	2500	4⅛x5¼	35x4†	36x6†	W
Huffman, B	1½	1995	3¾x5	34x3½	34x6	W
Huffman, C	1½	1795	3¾x5½	34x3½	34x6	I
Hurlburt	1½	....	4 x5½	34x4	34x5	W
Hurlburt	2½	....	4¼x5½	36x4	36x4d	W
Hurlburt	3½	....	4½x6	36x5	36x5d	W
Hurlburt	5	....	4½x6	36x5	40x6d	W
Huron Erie	1½	2425	3¾x5¼	36x3½	36x5	I
Huron Mich.	2½	2950	4¼x5½	36x4	36x7	I
Indep'd't(Iowa), B	1	1665	3½x5	34x3½	34x4	W
Indep'd't(Iowa), G	1½	2040	3¾x5¼	34x3½	34x5	I
Indep'd't(Ia.),H.I.	2½	2940	4⅛x5¼	34x4	34x6	I
Indep'd't(Ohio), F	1½	2585	3¾x5	36x3½	36x5	W
Indep'd't(Ohio) H	2½	2985	4¼x5¼	36x4	36x4d	W
Indep'd't(Ohio) K	3½	3985	4½x5½	36x5	36x5d	W
Indiana, 12	1¼	2290	3¾x5¼	34x3½*	34x5*	W
Indiana, 20	2	2950	4⅛x5½	36x4*	36x7*	W
Indiana, 25	2½	3150	4⅛x5½	36x4*	36x8*	W
Indiana, 35	3½	3750	4⅝x5½	36x5*	36x5d*	W
Indiana, 51	5	4795	5 x6¼	36x5*	40x6d*	W
Inland, D	2	2950	4 x5	34x5	34x6	I
International, S	¾	1500	3½x5	34x5†	34x5†	I
International, 21	1	1750	3½x5¼	36x3½	36x3½	I
International, 31	1½	1850	3½x5¼	36x3½	36x4	I
International, 41	2	2100	3½x5¼	36x3½	36x5	I
International, 61	3	2400	4¼x5	36x4	36x6	I
International, 101	5	3600	4¼x5	36x5	40x10	I
J & J, D	2	3250	4 x5	34x4*	34x6	I
Jackson, 4WD	3½	4550	4½x5½	36x7	36x7	B
Jumbo, 15	1½	2425	3¾x5¼	36x3½	36x5	I
Jumbo, 20	2	2675	3¾x5¼	36x3½	38x7†	I
Jumbo, 25	2½	3090	4½x5½	36x4	36x7	I
Jumbo, 30	3	3590	4¼x5½	36x6†	42x9†	I
Jumbo, 35	3½	4080	4½x6	36x5	36x10†	I
Jumbo, 40	4	4730	4½x6	38x7†	44x10	I
K-Z ,1	1	2250	3½x5	34x3½	34x5	W
K-Z ,1½	1½	2750	3¾x5	36x4	36x6	W
K-Z, 2½	2½	3250	4¼x5¼	36x4	36x8	W
K-Z, 3½	3½	4250	4½x5½	36x5	40x10	W
K-Z, 5	5	5200	4½x5½	36x6	40x6d	W
Kalamazoo, G-1	1½	2495	3¾x5	34x4	34x5	W
Kalamazoo, G-2	1½	2800§	3¾x5	36x5	36x6	W
Kalamazoo, H	2½	3275§	4 x6	36x4	36x8	W
Kalamazoo, K	3½	4000§	4¼x6	36x5	36x10	W
Kalamazoo, K-5	5	4500§	4½x6	36x6	36x6d	W
Karavan, A	2½	3900	4¼x6	36x4	36x8	W
Kearns, H	¾	1600	3½x4½	32x4½†	32x4½†	I
Kearns, N	1½	2200	3½x5	34x3½	34x6	I
Kelly-S., K-31*	1½	2900	3¾x5¼	36x3½	36x6	C
Kelly-S., K-34	1½	2900	3¾x5¼	36x3½	36x6	W
Kelly-S., K-38	2½	3250	3¾x5½	36x4	36x4d	W
Kelly-S., K-35	2½	3250	3¾x5½	36x4	36x4d	C
Kelly-S., K-40	3½	4200	4½x6½	36x5	40x5d	C
Kelly-S., K-41	3½	4200	4½x6½	36x5	40x5d	I
Kelly-S., K-42	3½	4200	4½x6½	36x5	40x5d	W

*2-cyl. †6-cyl. ‡8-cyl. All others, not marked, are 4-cyl. Trac., Tractor. **Canadian made.

Final Drive: W—Worm, I—Internal Gear, C—Chains, D—Double Reduction, B—Bevel, 4—Four-Wheel, E—External Gear. *Tires—optional. †Pneumatic Tires. All others solid. ††—Price includes body. §—Price includes several items of equipment.

*Kelly-Springfield.

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Kelly-S., K-45	4	$4550	4½x6½	36x5	40x6d	C
Kelly-S., K-50	5	4900	4½x6½	36x6	40x6d	C
Kelly-S, K-60	6	5100	4½x6½	36x6	40x7d	C
Keystone, 40	2	2450	3⅝x5½	34x5†	38x7†	I
Kimball, AB	2	3675	4 x6	36x4	36x7	W
Kimball, AC	2½	3975	4¼x6	36x4	36x8	W
Kimball, AK	3	4500	4½x6	36x4	36x10	W
Kimball, AE	4	5000	4¾x6	36x5	40x12	W
Kimball, AF	5	5975	5 x6	36x6	40x7d	W
Kissel, Express	1	1985††	3⅞x5½	34x5†	34x5†	W
Kissel, Utility	1½	2775	3⅞x5½	36x3½	36x5	W
Kissel, Freighter	2½	3475	4¼x5½	36x4	36x7	W
Kissel, H. D.	4	4475	4¼x5½	36x5	36x5d	W
Kleiber, AA	1	2600	4⅛x5¼	34x3½*	34x5*	W
Kleiber, A	1½	3100	4⅛x5¼	36x3½*	36x6*	W
Kleiber, BB	2	3600	4½x5¼	36x4*	36x7*	W
Kleiber, B	2½	4200	4½x5½	36x5*	36x8	W
Kleiber, C	3½	4900	4½x5½	36x5	36x5d	W
Kleiber, D	5	5600	5 x6½	36x6	40x12	W
Koehler, D	1½	1885	3½x5	34x3½	34x5	W
Koehler, M	2½	2875	4 x5⅛	36x4	36x7	W
Koehler, MCS	2½	2975	4 x5⅛	36x4	36x7	W
Koehler, F	3½	3985	4½x5½	36x5	36x10	W
Koehler, MT, Trac	5	2975	4 x5⅛	36x4	36x7	W
L.M.C., 2-20	2½	2540	4⅝x5¼	36x4	36x4d	I
Lange, B	2½	3350	4⅛x5¼	36x4*	36x6*	C
Larrabee, XZ	¾-1	1925	3¼x4½	34x5†	34x5†	B
Larrabee, U	1½	2400	3¾x5	34x3½	34x6	W
Larrabee, SK	2½	3200	4⅛x5¼	36x4	36x7	W
Larrabee, FL	3½	4000	4½x5½	36x5	36x5d	W
Larrabee, FW	5	4800	4¾x6	36x6	40x6d	W
Lion, L	1	2350	3⅜x5⅛	35x5†	35x5†	W
Luedinghaus, C	1	2100	3½x5	35x5†	35x5†	W
Luedinghaus, W	1½	2700	3⅜x5¼	34x3½*	34x5*	W
Luedinghaus,	2-2½	3150	4¼x5¾	36x4*	36x7*	W
Maccar, L	1½	2925	4¼x5¼	36x4	36x6	W
Maccar, H-2	2½	3650	4½x5½	36x4	36x4d	W
Maccar, M-2	3½	4500	4½x6	36x5	36x5d	W
Maccar, G	5	5500	4¾x6	36x5	40x6d	W
MacDonald, A	7½	5750	4½x6	40x7	40x14	I
Mack, AB D.R.	1½	3450	4 x5	36x4	36x3½d	D
Mack, AB	2½	3400	4 x5	36x4	36x4d	C
Mack, AB-Chain	1½	3000	4 x5	36x4	36x3½d	C
Mack, AB Chain	2	3300	4 x5	36x4	36x4d	C
Mack, AB D.R.	2	3750	4 x5	36x4	36x4d	D
Mack, AC Chain	3½	4950	5 x6	36x5	40x5d	C
Mack, AC Chain	5	5500	5 x6	36x6	40x6d	C
Mack, AC Chain	6½	575[illegible]	5 x6	36x6	40x12	C
Mack, AC Chain	7½	6006	5 x6	36x7	40x7d	C
Mack Trac., AB	5	3406	4 x5	36x4	36x4d	C
Mack Trac., AC	7	4950	5 x6	36x5	40x5d	C
Mack Trac., AC	10	5500	5 x6	36x6	40x6d	C
Mack Trac., AC	13	5750	5 x6	36x6	40x12	C
Mack Trac., AC	15	6000	5 x6	36x7	40x7d	C
Mapleleaf, AA**	2	4150	4 x5¼	36x4	36x7	W
Mapleleaf, BB**	3	4775	4¼x5½	36x4	36x4d	W
Mapleleaf, CC**	4	5770	4½x5½	36x5	36x5d	W
Mapleleaf, DD**	5	6825	4½x5½	36x6	40x6d	W
Master, JW	1½	2690	4⅛x5½	34x3½	34x5	W
Master, W	2½	3290	4¼x5½	34x4	36x7	W
Master, D	2½	3540	4¼x5½	34x4	36x7	D
Master, A	3½	4190	4½x6	36x5	40x5d	W
Master, E	3½	4640	4½x6	36x5	40x5d	D
Master, B	5	5290	4¾x6½	36x6	40x6d	W
Master, F	5	5440	4¾x6½	36x6	40x6d	D
Master Trac., T	6	3740	4¼x5½	34x4	36x7	D
Maxwell, 1½	1½	1332	3⅝x4¼	32x3	32x4	W
Menominee, HT	1	2080	3¾x5	34x3½	36x5	W
Menominee, H	1½	2725	4 x5	36x3½	36x5	W
Menominee, D	2	3245	4 x6	36x4	36x8	W
Menominee, G	3½	4270	4½x6	36x5	36x10	W
Menominee, J3	5	5450	4¾x6	36x6	40x12	W
Moline, 10	1½	2450	3½x5	34x5†	36x6†	I
Moreland, 20N	1	2850	3¾x5	35x5†	36x6†	I
Moreland, 21B	1½	2800	4¼x5¼	36x3½	36x6	W
Moreland, 21C	2½	3500	4½x5½	36x4	36x8	W
Moreland, 21H	3½	4600	4¾x6	36x5	40x5d	W
Moreland, 21J	5	5000	4¾x6	36c6	40x6d	W
Mutual, 2B	2	3450	4 x6	36x4	36x8	W
Mutual, 2BP	2½	4150	4 x6	38x7†	42x9†	W
Napoleon, 7	¾-1	1350	3½x5	38x4	33x4†	I
Napoleon, XX-7	1	1535	3½x5	35x5*	35x5*	I
Napoleon, 11	1½	1860	3½x5	35x5*	36x6*	I
Nash, 2016	1	1895	3¾x5¼	35x5	36x6	I
Nash, 3018	2	2550	3¾x5¼	36x6	40x8	I
Nash, Quad.	2	3250	4¼x5½	40x8	40x8	I
*Nelson, F1½	1½	....	4½x5¼	36x3½	36x5	W
*Nelson, F2	2	....	4½x5¼	36x4	36x7	W
*Nelson, F3½	3½	....	4½x5½	36x5	36x5d	W
*Nelson, FC5	5	....	4¾x6	36x6	40x6d	W
Netco, D	2	3100	4½x5¼	36x4*	36x7*	W
Netco, H	2½	3500	4½x5½	36x4*	36x8*	W
New York, M	1½	....	4¼x5¼	36x3½	36x5	W
New York, N	2-2½	....	4½x5¼	36x4	36x4d	W
Niles, E	2	3000	4¼x5¼	36x4*	36x7*	W
Noble, B30	1½	2585	3¾x5¼	36x3½	36x5	W
Noble, C40	2	2825	4 x5½	36x4	36x7	W
Noble, D50	2½	3150	4¼x5½	36x4	36x8	W
Noble, E70	3½	4030	4½x6	36x5	36x10	W
Northway, B-2	2	3400	4 x6	36x4	36x4d	W
Northway, B-3	3½	4400	4 x6	36x5	40x5d	W
Northwestern W	2	3300	4¼x5¼	34x4	36x6	W
Northwestern WS	2½	3500	4½x5½	36x4	36x8	W
Norwalk, 25E	1	1695	3½x5	34x3½	34x4	W
Norwalk, 35E	1½	2025	3½x5	34x3½	34x3½d	W
Norwalk, 35E Spec	1½	2285	3¾x5¼	34x3½	34x5	W
O. K., K1	1½	2675	4 x5½	36x3½†	36x5†	W
O. K., L1	2½	3450	4¼x5½	36x4	36x8	W
O. K., M1	3½	$4250	4½x6	36x5	36x5d	W
Ogden, A1	1½	2550	3¾x5	36x3½	36x5	W
Ogden, E	2½	3250	4½x5¼	36x4	36x7	W
Old Hickory, W	1	2175	3⅜x5	36x3½*	36x4*	W
Old Reliable, A	1½	2350	4 x5	34x4	36x6	W
Old Reliable, B	2½	3500	4¼x6	34x4	36x4d	W
Old Reliable, C	3½	4250	4¼x6	36x5	36x5d	W
Old Reliable, D	5	5250	4¾x6	36x6	40x6d	W
Old Reliable, KLM	7	6000	4¾x6¼	36x6	40x7d	C
Oldsmobile Econ.	1	1250	3½x5¼	35x5†	35x5†	I
Olympic, A	2½	3500	4½x5½	36x4	36x7	W
Oneida, A-9	1¼	2350	3⅝x5½	36x3½	36x5	W
Oneida, B-9	1¾	2915	4 x5¼	36x4	36x7	W
Oneida, C-9	2½	3390	4 x5¼	36x4	36x7	W
Oneida, D-9	3½	4345	4½x5½	36x5	36x10	W
Oneida, E-9	5	5460	4½x5½	36x6	40x12	W
Orleans, A	1½	2750	3⅜x5⅛	36x3½	36x5	W
Orleans, B	2½	3250	4x5⅛	36x4*	36x7*	W
Orleans, C	3½	3750	4½x5½	36x4½	36x8	W
Orleans, D	5	4250	4½x5½	36x6	40x8	W
Oshkosh, A	2	3750	3½x5	36x6†	36x6†	4
Oshkosh, AA	2	3850	3½x5	36x6†	36x6†	4
Oshkosh, B	2½	4150	4 x5⅛	38x7†	38x7†	4
Oshkosh, BB	2½	4300	4 x5⅛	38x7†	38x7†	4
Packard, EC	....	3500	4⅞x5½	36x4	36x7	W
Packard, ED	....	4100	4½x5½	36x5	36x5d	W
Packard, EF	....	4500	5 x5½	36x6†	40x6d†	W
Packard, EX	....	4000	4⅞x5½	36x6†	40x8†	W
Paige, 52-19	1½	2880	4 x5¼	34x3½	34x6	W
Paige, 54-20	2½	3400	4¼x5½	34x4	34x4d	W
Paige, 51-18	3½	4285	4½x5½	36x5	36x5d	W
Parker, F20	2	3500	4 x6	34x4	36x4d	W
Parker, J20	3½	4400	4½x6	36x5	40x5d	W
Parker, M20	5	5500	4¾x6	36x6	40x6d	W
Patriot, Revere	¾	1785	3⅜x5	35x5†	35x5†	W
Patriot, Lincoln	1½	2450	4 x5¼	34x3½*	34x5*	W
Patriot, Washgt'n	2½	3450	4½x5½	36x4*	36x7*	W
Piedmont, 4-30	1½	1685	3½x5	34x4†	34x4†	W
Pierce-Arrow,	2	3200	4 x5½	36x4	36x4d	W
Pierce-Arrow	3½	4350	4½x6¾	36x5	36x5d	W
Pierce-Arrow	5	4850	4½x6¾	36x5	40x6d	W
Pioneer, 59	1	1550	3⅜x4¼	32x4½†	32x4½†	W
Pittsburger, C-21	2½-3	3500	4½x5¼	36x5*	36x7*	W
Pony	¼	400	2⅜x4	28x3†	28x3†	C
Power, F	1½	....	3⅜x5¼	36x6	36x6	W
Power, C	3½	....	4¼x5½	36x5	40x10	W
Premocar, B-143	1½	2475	3½x5	36x6†	36x6†	W
Ramier, R-11	¾	2150	3½x5	35x5†	35x5†	W
Rainier, R-19	1	2350	3½x5	34x3½	31x4	W
Rainier, R-16	1½	2600	3⅜x5	34x3½	34x5	W
Rainier, R-18	2	2950	4½x5¼	34x4	34x6	W
Rainier, R20	2½	3600	4½x5¼	34x4	34x7	W
Rainier, R-15	3½	4500	4½x5½	36x5	36x5d	W
Rainier, R17	5	5250	4½x6	36x6	36x6d	W
Ranger, TK-20-2	2	....	3¾x5.	36x6†	36x6†	W
Reo, F	¾-1½	1385	4½x4½	34x4½†	34x4½†	B
Reliance, 10A	1½	2400	4 x5½	36x3½	36x5	I
Reliance, 20B	2½	3100	4¼x5½	36x4	36x4d	I
Republic, 75	¾	1395††	3½x5	32x4½	32x4½	I
Republic, 10	1	1695	3¾x5	35x5†	35x5†	I
Republic, 10Exp.††	1	2095	.....	35x5†	35x5†	I
Republic, 11X	1½	2295	3¾x5	34x3½	34x5	I
Republic, 19	2½	2795	4½x5¼	36x4	36x7	I
Republic, 20	3½	3845	4½x5½x	36x5	36x10	I
Riker, B	3	4600	4¼x6	36x5	36x5d	W
Riker, BB	4	4800	4¼x6	36x5	36x6d	W
Rowe, CW	1½	3000	3¾x5	36x6†	36x6†	W
Rowe, C. D. W.	2	3300	4 x5	34x4	36x3½d	W
Rowe, G. S. W.	3	4150	4 x6	34x5	36x5d	W
Rowe, G. P. W.	3	5250	3¼x5†	38x7†	42x9†	W
Rowe, HW	4	4500	4¼x6	36x5	36x6d	W
Rowe, F. W.	5	5500	4½x6	36x6	40x6d	W
Rumely, A	1½	2720	3¾x5¼	36x3½	36x5	W
Samson, KO 15	¾	....	3½x4	32x4	32x4	B
Samson, E 25	1¼	1395	3½x5½	35x5	35x5	B
Sandow, G	1	2295	3¾x5	34x3½	34x5	W
Sandow, CG	1½	2590	3¾x5	34x4	34x6	W
Sandow, J	2½	3275	4¼x5¼	36x4	36x7	W
Sandow, M	3½	4295	4½x5½	36x5	36x5d	W
Sandow, L	5	4975	4½x5½	36x6	40x6d	W
Sanford, 25	2½	3350	4½x5¼	36x4	36x4d	W
Sanford, 35	3½	4200	4½x5½	36x5	36x5d	W
Sanford, 50	5	5100	4¾x6	36x5	40x6d	W
Schacht, 2-Ton	2	3550	4¼x5½	36x4	36x7	W
Schacht, 2½-Ton	2½	3850	4¼x5½	36x4	36x4d	W
Schacht, 3½-Ton	3½	4350	4¼x6	36x5	36x5d	W
Schacht, 5-Ton	5	5350	4½x6	36x5	40x6d	W
Schwartz, A	1	1685	3½x5	33x4½†	33x4½†	B
Schwartz, BW	1½	2600	3⅜x5¼	34x3½*	34x7*	W
Schwartz, C.W.S.	2½	3200	4¼x5½	36x4	36x8	W
Schwartz, DW	5	4900	4½x6	36x6	40x12	W
Selden, 1½A	1½	2360	3⅜x5	34x3½	34x5	W
Selden, 2½A	2½	3425	4¼x5¼	36x4	36x7	W
Selden, 3½A	3½	4175	4½x5½	36x5	36x10	W
Selden, 5A	5	5600	4¾x6	36x6	40x12	W
Seneca, M	½	1020	3½x4½	30x3½†	30x3½†	B
Service, 15	¾-1	1840	3⅜x5	34x4½	35x5	B
Service, 220	1	2415	3½x5½	34x3½	34x5	W
Service, 31	1½	2985	4 x5½	36x3½	36x6	W
Service, 26	1½	3415	4¼x5½	35x5†	38x7†	W
Service, 51	2½	3475	4¼x5½	36x4	36x7	W
Service, 71	3½	4285	4¼x5½	36x5	36x5d	W
Service, 76	3½	4485	4½x6	36x5	36x5d	W
Service, 101	5	5275	4½x6	36x6	40x6d	W
Signal, NF	1	2475	4⅜x5	34x5†	36x6†	W
Signal, H	1½	2925	4½x5¼	34x4	36x6	W
Signal, J	2½	3275	4½x5¼	34x4	36x8	W
Signal, M	3½	4275	4½x5½	36x5	40x5d	W
Signal, R	5	5300	4¾x6	36x6	40x6d	W
Southern, 10	1	2090	3⅜x5	34x3½	34x4	W
Southern, 15	1½	2590	3¾x5⅛	36x6†	34x4	W
Southern, 20	2	2990	4¾x5¼	36x6†	40x8*	W
Standard, 1-K	1-1½	1950	3⅜x5	34x3½*	34x5*	W
Standard, 76	2½-3	3100	4½x5¼	36x4*	36x7*	W
Standard, 66	3½-4	4000	4½x5½	36x5	36x10	W
Standard, 5-K	5-7	5250	4¾x6	36x6	40x12	W
Sterling, 1½	1½	3200	4 x5¾	36x3½	36x5*	W
Sterling, 2	2	3500	4 x5¾	36x4	36x6	W
Sterling, 2½	2½	3650	4⅜x5¼	36x4*	36x4d*	W
Sterling, 3½	3½	4650	4½x6¼	36x5*	40x5d*	W
Sterling, 5-W	5	5500	5 x6¼	36x6*	40x6d*	W
Sterling, 5-C	5	6000	5 x6¼	36x6	40x6d	C
Sterling, 7½	7½	6500	5 x6¼	36x6	40x7d	C
Stewart, 15	1	1875	3½x5	35x5†	35x5†	I
Stewart, 9	1½	2200	3⅜x5	34x3½	34x5	I
Stewart, 7	2	2800	4⅛x5¼	34x4	34x7	I
Stewart, 7-X	2½	2950	4⅛x5½	34x4	34x7	I
Stewart, 10	3½	3850	4½x5½	36x5	36x5d	I
Stewart, 10-X	3½	3850	4½x6	36x5	36x5d	I
Stoughton, A	1	1995	3¾x5¼	34x4½†	35x5†	W
Stoughton, B	1½	2350	3⅜x5¼	36x3½	36x5	W
Stoughton, D	2	2800	4 x5⅛	36x4	36x7	W
Stoughton F	3	3600	4¼x5½	36x5d	36x5d	W
Sullivan, E	2	3350	4¼x5½	36x4*	36x7*	W
Sullivan, H	3½	4650	4½x6	36x5	36x5d	W
Superior, D	1	1650	3⅜x5	34x4½†	34x4	I
Superior, E	2	2600	4⅛x5¼	36x4	36x6	I
Super Truck, 50	2½	3300	4 x6	36x4	36x8	W
Super Truck, 70	3½	4300	4¼x6	36x5	40x5d	W
Super Truck, 100	5	5300	4¾x6	36x5	40x12	W
Super Truck 150	7½	6300	5 x6	36x6	40x7d	W
Texan, A38	¾	1095	3½x5	33x4	33x4	I
Texan, TK39	1½	1550	3½x5	36x6	38x7	W
Tiffin, GW	1½	2400	4⅛x5¼	36x3½	36x5	W
Tiffin, MW	2½	3100	4⅛x5¼	36x4	36x3½d	W
Tiffin, PW	3½	4100	4½x5½	36x5	40x5d	W
Tiffin, F50	5	4800	4¾x6	36x6	40x6d	W
Tiffin, F60	6	5000	4¾x6	36x6	40x12	W
Titan, HT	3½	4550	4½x6	34x4*	40x5d	I
Titan, HD	5	5400	4½x6	36x5	40x6d	I
Titan, TS	2½	3400	4¼x5½	34x4*	36x4d	I
Tower, J	1½	3000	4⅛x5¼	35x5	38x7	W
Tower, H	2½	3475	4⅛x5¼	36x4	36x7	W
Tower, G	3½	4400	4½x5½	36x5	36x5d	W
Traffic, C	....	1595	3¾x5	34x3½	34x5*	I
Transport, 20	1	1395	3⅜x5⅛	34x3½	34x4	I
Transport, 30	1½	1995	3¾x5	36x3½	36x5	I
Transport, 50	2½	2785	4¼x5½	36x4	36x7	I
Transport, 70	3½	3885	4½x6	36x5	36x10	I
Traylor, B	1½	2390	3⅜x5½	34x3½	34x5	W
Traylor, C	2	2850	4 x5½	36x4	36x7	W
Traylor, D	3	3300	4¼x5½	36x4	36x8*	W
Traylor, E	4	4450	4½x6	35x5	40x10	W
Traylor, F	5	4700	4½x6	36x6	40x6d	W
Triangle, AA	¾-1	1385	3½x5	34x4½†	34x4½†	I
Triangle, A	1½	2350	3¾x5¼	34x3½*	34x6*	I
Triangle, C	2	2700	3¾x5¼	36x4*	36x6*	I
Triangle, B	2½	2950	4 x5¾	36x4*	36x7*	I
Triumph, G	1	1995	3½x5½	34x5†	34x5†	W
Triumph, HC	1½	2550	3¾x5¼	36x3½	36x5	W
Triumph, HB	2	2900	3¾x5¼	36x4	36x7	W
Twin City, B.W.	2	2750	4 x5½	36x4	36x7	I
Twin City, A. W.	3½	4000	4¼x6	36x5	40x5d	W
Twin City, FWDB	3½	4750	5½x6	36x6	36x6	I
Twin City, FWDA	5	5250	5½x6	36x7	36x7	I
Ultimate, A	2	3200	4 x5½	36x3½	36x6*	W
Ultimate, AJ	2	3250	4¼x5½	35x5†	38x7†	W
Ultimate, B	3	3750	4¼x5½	36x4*	36x4d*	W
Ultimate, BL	3	3850	4¼x5½	36x4*	36x4d*	W
Union, F W	2½	3490	4 x6	36x5*	36x8*	D
Union, H W	4	4485	4½x6	36x6	40x12	D
Unicn, J W	6	5800	5 x6	36x6	40x14	D
United, A	1½	2445	3¾x5¼	36x3½	34x5*	I
United, B	2½	3150	4¼x5½	36x4	36x7*	I
United, C	3½	3975	4¼x5½	36x5	36x5d	I
United, V	5	5000	4½x6	36x6	40x6d	I
U. S., N	1½	1975	3¾x5	36x3½	36x5*	I
U. S., R	3	3075	4 x5¼	36x4	36x4d	W
U. S., S	4	3875	4½x5½	36x5	36x5d	W
U. S., T	6	4850	4¾x6½	36x6	40x6d	W
Velie, 46	1½	2200	3¾x5	36x3½	36x5	I
Veteran, E**	1-1½	3500	3¾x5¼	35x5†	36x6†	W
Veteran, A**	2-2½	4000	4¼x5½	36x4*	36x7*	W
Veteran, D**	2½-3	4400	4¼x5½	36x4*	36x7*	W
Veteran, H**	3½-4	5600	4¼x6	36x5	36x5d	W
Victor, A	1½	2050	3¾x5	34x4	34x5	I
Vim, 29	½	1355	3½x4½	31x4†	31x4†	W
Vim, 30	½	1550	3½x4½	32x4½	32x4½	W
Vim, 31	1	2475	3¾x5⅛	35x5†	35x5†	W
Vim, 22	2	3150	3¾x5⅛	36x4	36x6	W
Vim, 23	3	3950	4¼x5½	36x5	36x5d	W
Vulcan, 25	2½	4000	4¼x6	36x4	36x8	W
Vulcan, 25P	3	4500	4¼x6	36x6	40x8	W
Walker-Johnson, B	2½	3500	4¼x5½	36x4	36x8	W
Walter, S	5	5600	4½x6¼	36x6	40x6d	D
Waltham, E	1½	2350	3¾x5¼	36x3½	38x5	W
Ward-LaF., 2B	2½	3590	4⅝x5¾	36x4	36x7	W
Ward-LaF., 4A	3½	4690	4½x6¼	36x5	36x5d	W

*2-cyl. †6-cyl. ‡8-cyl. All others, not marked, are 4-cyl. Trac., Tractor. **Canadian made.

Final Drive: W—Worm, I—Internal Gear, C—Chains, D—Double Reduction, B—Bevel, 4—Four-Wheel, E—External Gear. *Tires—optional. †Pneumatic Tires. All others solid. ††—Price includes body. §—Price includes several items of equipment.

*Nelson Le Moon

Specifications of Current Motor Truck Models—Continued

NAME AND MODEL	Tons Capacity	Chassis Price	Bore and Stroke	TIRES Front	TIRES Rear	Final Drive
Ward-LaF., 5A	5	$5590	5 x6½	36x6	40x6d	W
Watson, E	1	1865	3¾x5¼	35x5†	35x5†	W
Watson, N	3½	4250	4½x5½	36x5	36x10	W
Western, W1½	1½	2550	4½x5¼	36x3½*	36x5*	W
Western, L1½	1½	2550	3¾x5	36x3½*	36x5*	W
Western, W2½	2½	3250	4¼x5¼	36x4	36x7	W
Western, L2½	2½	3250	4¼x6	36x4	36x7	W
Western, W3½	3½	4250	4½x6	36x5	40x5d	W
White, 15	¾	2400	3¾x5½	34x5†	34x5†	B
White, 20	2*	3250	3¾x5½	36x4*	36x7	D
White, 40	3½	4200	3¾x5¾	36x5	40x5d	D
White, 45	5	4500	4¼x5¾	36x6	40x6d	D
White Hick., E	1	2450	3¾x5	34x5†	34x5†	W
White Hick., H	1½	2750	3¾x5	36x3½	36x5	W
White Hick., K	2½	3350	4½x5½	36x4	36x5	W
Wichita, K	1	2300	3¾x5¼	36x3*	36x4*	W
Wichita, L	1½	2600	3¾x5¼	36x3½*	36x5*	W
Wichita, M	2	2800	3¾x5¼	36x3½*	36x6*	W
Wichita, R	2½	3000	3¾x5¼	36x4*	36x7*	W
Wichita, RX	2½	3600	4¼x6	36x4*	36x8*	W
Wichita, O	3½	$4000	4¼x6	36x5*	36x5d*	W
Wichita, S	5	5000	4½x6	36x6	40x6d	W
Wilcox, AA	1	2100	3¾x5½	36x4*	36x4*	W
Wilcox, B	1½	2775	4¼x5	36x4	36x5	W
Wilcox, D	2½	3300	4¼x5	36x4*	36x3½d*	W
Wilcox, E	3½	4250	4½x6	36x5*	36x5d*	W
Wilcox, F	5	5200	4¾x6½	36x5	40x6d	W
Wilson, F	1½	2270	3¾x5	36x3½	36x5	W
Wilson, EA	2½	2825	4½x5¼	36x4	36x7	W
Wilson, G	3½	3685	4½x5½	36x5	36x5d	W
Wilson, H	5	4520	4¾x6	36x6	40x6d	W
Winther, 751	¾	1795	3½x5	34x4½†	35x5†	I
Winther, 430	1½	$2850	3¾x5	32x4	32x4	I
Winther, 39	1½	2450	3¾x5	34x3½	34x5	I
Winther, 49	2	3250	4 x5	34x4	34x4d	I
Winther, 70	3½	4200	4 x6	36x5	36x5d	I
Winther, 450	4	3690	4 x5	34x5	36x6	I
Winther, 109	5	5250	4½x6	36x6	40x5d	I
Winther, 140	7	5900	5 x6	36x6	40x7d	I
Wisconsin B	1	1950	4 x5¾	34x5†	34x5†	W
Wisconsin C	1½	2300	4⅜x5¾	36x6†	36x6†	W
Wisconsin D	2½	3500	4½x6¼	36x6	36x10	W
Wisconsin E	3½	4000	5 x6¼	36x6†	36x12†	W
Witt-Will, N	1½	2750	3¾x5	36x3½*	36x5*	W
Witt-Will, P	2½	3250	4½x5¼	36x3½*	36x7*	W
Wolverine, J	1	2125	3½x5	34x3	34x4	I
Wolverine, J	1½	2375	3¾x5	34x3½	34x5	I
Wolverine, J	2	2640	3¾x5	34x4	34x7	I
Wolverine, J	2½	3425	4¼x5¼	36x5	36x10	I
Wolverine, L	3½	4100	4½x5½	36x5	36x10	I
Yellow Cab M21	¾	2050	3¾x5	32x4	32x4	B
Yellow Cab M41	1¼	2350	3¾x5	34x4½	34x4½	W

*2-cyl. †6-cyl. ‡8-cyl. All others, not marked, are 4-cyl. Trac., Tractor. **Canadian made.

Final Drive: W—Worm, I—Internal Gear, C—Chains, D—Double Reduction, B—Bevel, 4—Four-Wheel, E—External Gear. *Tires—optional. †Pneumatic Tires. All others solid. ††—Price includes body. §—Price includes several items of equipment.

Farm Tractor Specifications and Prices

TRADE NAME	Rating	Price	Wheels or Crawlers	Engine	Cylinders: Bore, Stroke	Fuel	Plow Capacity
All-In One	16-30	$1975	3	Clim.	4-5 x6½	GDK	3-4
Allis-Chalm. B	6-12	925	2	LeR.	4-3⅛x4½	Gas.	1
Allis-Chal. G.P	6-12	850	2	LeR.	4-3⅛x4½	Gas.	1-2
Allis-Chalm.	12-20	1495	2	Mid.W	4 4⅛x5¼	Gas.	2-3
Allis-Chalm.	18-20	2150	4	Own	4-4¾x6½	GorK	3-4
Allis-Chalm	10-18	875	4	Own	4-4¾x6½	G,K	4
Allwork...2-G	14-28	1875	4	Own	4-4¾x6	GorK	3
Allwork...C	14-28	1675	4	Own	4-5 x6	GorK	3
AndrewsKin.D	18-36	2500	4	Clim.	4-5 x6½	GorK	4
Appleton	12-20	1500	4	Buda	4-4¼x5½	G,K	2-3
Aro.....1921	3-5	550	4	Own	1-4½x5	Gas.	1
Aultman-T.	15-30	2200	4	Clim.	4-5 x6½	G,K	4
Aultman-T.	22-45	3850	4	Own	4-5½x8	G,K	6
Aultman-T.	30-60	5000	4	Own	4-7 x9	G,K,D	8
Automot. B-3	12-24	1785	4	Herc.	4-4 x5½	Gas.	2-3
Avery.SR.Cul	5-10	....	4	Own	4-3 x4	G,K	..
Avery..Cult-C	....	....	3	Own	6-3 x4	G,K	..
Avery.....B	5-10	....	4	Own	4-3 x4	G,K	2
Avery.....C	....	....	4	Own	6-3 x4	G,K	..
Avery.....	8-16	....	4	Own	2-5½x6	G,K,D	2-3
Avery.....	12-20	....	4	Own	4-4½x6	G,K,D	2-3
Avery.....	12-25	....	4	Own	2-6½x7	G,K,D	3-4
Avery.....	14-28	....	4	Own	4-4⅞x7	G,K,D	3-4
Avery.....	18-36	....	4	Own	4-5½x6	G,K,D	4-5
Avery.....	25-50	....	4	Own	4-6½x7	G,H,D	5-6
Avery.....	45-65	....	4	Own	4-7¾x8	G,K,D	8-10
Bates	15-25	....	4	Own	4-4¼x6	Ker.	3
Bates Mule.H	15-25	....	4	Midw	4-4½x5¼	Gas.	3
Bates Mule..F	18-25	....	*2	Midw	4-4½x5¼	Gas.	3
Bates Mule G	25-35	....	*2	Midw	4-4½x6	Gas.	com.
Bean	8-16	....	*1	Own	4-3⅞x4	G,K	2-3
Beeman.....G	2-4	315	4	Own	1-3½x4½	Gas.	½
Best	30	....	*2	Own	4-4¾x6½	G,K,D	4
Best	60	....	*2	Own	4-6½x8½	G,K,D	8-9
Boring....1921	....	1850	3	Wauk	4-4⅜x5¾	GorK	2
Burn-Oil.1921	15-30	1650	4	Own	2-6¾x7	Ker.	3-4
Capital	15-30	1000	2	Own	4-4⅞x6	Gas.	3
Case	10-18	1090	4	Own	4-3⅞x5	GorK.	2
Case	15-27	1680	4	Own	4-4½x6	GorK	3
Case	22-40	3100	4	Own	4-5½x6¼	GorK	4-5
Caterpillar T11	25	....	*2	Own	4 4¾x6	Gas.	4
Caterpillar T16	40	....	*2	Own	4-6½x7	Gas.	6
Centaur	5-2½	455	2	N Way	2-4½x4½	G or K	1-9
Chase	12-25	2100	3	Buda	4-4¼x5½	GorK	2-3
Chicago....40	40	2500	4	Own	4-4½x6	Gas.	4
Cletrac.....W	12-20	1495	*2	Own	4-4 x5½	G,K,D	2-3
Dakota.....4	15-27	1750	3	Dom.	4-4¾x6	Gas.	3
Dart.....B.J.	15-30	2100	4	Buda	4-4½x6	Gas.	3-4
Depue.....A	20-30	2500	4	Buda	4-4½x6	Gas.	4
Dill.....D	20	2480	4	Cont.	4-4½x5½	Gas.	3
Dill.....R.W.	20-	2980	4	Midw	4-4½x6	Gas	3
Do-It-All	-7	595	..	Own	1-4½x5	Gas.	..
Eagle.....F	12-22	1390	4	Own	2-7* x8	GorK	3-4
Eagle.....F	16-30	1850	4	Own	2-8 x8	GorK	4-5
E-B.....AA	12-20	1445	4	Own	4-4¾x5	GorK	3
E-B.....Q	12-20	925	4	Own	4-4¾x5	GorK	3
E-B	16-32	2000	4	Own	4-5¼x7	GorK	4
Evans	18-30	2000	4	Buda	4-4½x6	G,K	3
Fageol.....D	9-12	1525	4	Lyc.	4-3½x5	Gas.	2
Farm Horse.B	18-30	1885	4	Clim.	4-5 x6½	G,K	3-4
Farquhar	15-25	....	4	Buda	4-4½x6	G,K,D	3-4
Farquhar	18-35	....	4	Own	4-6 x8	G,K,D	4-5
Farquhar	25-50	....	4	Own	4-7 x8	G,K,D	6-7
Fitch	4	20-35	....	4	Clim.	4-5 x6½	GorK
Flour City	20-35	....	4	Own	4-5¼x6	Ker.	4-6
Flour City	30-50	....	4	Own	4-6¾x7	Ker.	6-8
Flour City	40-70	....	4	Own	4-7½x9	Ker.	8-1
Fordson	.. 20	625	4	Own	4-4x5	G,K	2
Fox.....E	20-40	3100	4	Own	4-5½x7½	G or K	4
Franklin....G	18-30	4000	*2	Clim.	4-5 x6½	G or K	3-3
Franklin....C	18-30	3350	*2	Clim.	4-5x6½	G or K	3-4
Franklin..G 2	18-30	4350	2	Clim.	4-5 x6½	G or K	3-4
Frick.....A	12-20	....	4	Erd.	4-4 x6	G,K	2-3
Frick.....C	15-28	....	4	Beav.	4-4¾x6	G,K	3-4
G-O.....G	14-28	1485	4	Wauk.	4-4½x5¾	GorK	3
Grain Belt..A	18-36	2150	4	Wauk.	4-4¾x6¾	GorK	4
Gray.....1920	18-36	$2000	3	Wauk	4-4¾x6¾	Gas.	4
Ground Hog	19-31	2000	4	Erd.	4-4 x6	GorK	3
Gt. Western St	20-30	1950	4	Beav.	4-4¾x6	K.	4
Hart-Parr..20	20	995	4	Own	2-5½x6½	K.D	3
Hart-Parr..30	30	1595	4	Own	2-6½x7	K,D	3
Heider.....D	9-16	1170	4	Wauk	4-4½x5¾	G,K	2
Heider.....C	12-20	1395	4	Wauk	4-4½x6¾	G,K	3
Heider...Cult	6-10	1050	4	LeR.	4-3½x4½	Gas.	1
Hicks	20-30	....	4	....	4-4½x6	KorG	4
Huber Light 4	12-25	1185	4	Wauk	4-4½x5¾	GorK	3
Huber Super 4	15-30	1885	4	Midw.	4-4½x6	Gas.	3
Illinois, Super-Drive.....C	18-36	2500	4	Clim.	4-5 x6½	G,K	4
Imperial.....E	40-70	5000	4	Own	4-7½x9	G,K,D	10
Indiana.....F	5-10	....	2	LeR.	4-3½x4½	Gas.	1-2
International..	8-16	900	4	Own	4-4¼x5	G,K,D	2
International..	15-30	1750	4	Own	-5¼x8	G,K,D	4
J-T.....N	20-40	3485	*2	Chief.	4-4¾x6	G,K,D	3-4
Klumb.....F	16-32	1650	4	Clim.	4-5 x6½	....	..
Knudsen, 1920	25-45	2500	4	Own	4-5 x9	Gas	4-6
LaCrosse...M	6-12	900	4	Own	2-4 x6	G,K	1
LaCrosse...G	12-24	1250	4	Own	2-6 x7	GorK	3
Lauson	12-25	1495	4	Midw.	4-4¼x5¼	Gas.	3
Lauson	15-25	1685	4	Beav.	4-4½x6	GorK	3-4
Lauson.....21	15-30	1985	4	Beav.	4-4¾x6	GorK	3-4
Leader.....B	12-18	1095	4	Own	2-6 x6¼	G,K,D	2-3
Leader.....N	16-32	1985	4	Clim.	4-5 x6½	G,K	3-4
Leader...GU	18-35	2775	*2	Clim.	4-5x6½	G,K	3-4
Leonard....E	20-30	2530	4	Buda	4-4½x6	G,K	3
Liberty.....A	18-32	2475	4	Clim.	4-5 x6½	G,K	4
Linn.....H4J	40-	4500	*	Cont.	4-4½-5½	Gas	4
Linn.....W	60	5100	*	Wauk.	4-5 x6¼	Gas.	6
Little Giant..B	16-22	2200	4	Own	4-4½x5	K.	4
Little Giant..A	26-35	3300	4	Own	4-5½x6	K.	6
Lombard	85-150	....	*2	....	6-5½x6¾	Gas.	16
Lombard	50	....	*2	....	4-4¾x6½	....	6-10
Magnet.....B	14-28	1875	4	Wauk	4-4½x6¼	K&G	3
Master Jr	5-10	585	..	LeR.	-2¾x4	Gas.	1
Merry Gar1921	2	230	2	Evin	1-2⅝x2½	Gas.	..
Minne ..All-P	12-25	1200	4	Own	4-4½x7	GorK	3
Minne. Gen P.	17-30	1850	4	Own	4-4¾x7	GorK	3-4
Minne. Med.Duty	22-44	3300	4	Own	4-6x7	GorK	5-6
Minne. HeavyDuty	35-70	4600	4	Own	4-7½x9	GorK	8-9
Mohawk 1921	8-16	785	4	Light	4-3¼x4½	KorG.	1-2
Moline Univ D	9-18	990	2	Own	4-3½x5	Gas.	2-
Moline Orch.	9-18	1075	2	Own	4-3½x5	Gas.	2-3
Motor Macult.	1½	195	2	Own	1-2¾x3½	Gas.	..
Motox	15-30	2250	4	Buda	4-4½x6	Gas.	3-4
NB.....1	3-6	425	4	Own	2-3¼x4	Gas.	¾
NB.....2	3-6	425	4	Own	2-2¾x4	Gas.	¾
Nichols-Shep. 20-42	20-42	3100	4	Own	8 x10	GorK	3-6
Nichols Shep. 25-50	25-50	3400	4	Own	9 x12	GorK	4-7
Nilson Jr....E	15-25	1775	4	Wauk	4-4¼x5¾	G or K	3
Nilson Senior.	20-40	2475	5	Wauk	4-5 x6¼	G,K	4
Oil Pull.....K	12-20	1485	4	Own	2-6 x8	K,D	3
Oil Pull.....H	16-30	2285	4	Own	2-7 x8½	K,D	4
Oil Pull.....G	20-40	3175	4	Own	2-8 x10	K,D	5-6
Oil Pull.....E	30-60	4590	4	Own	2-10x12	K,D	8-10
Oldsmar GarK	2½-5	395	4	Own	1-5½x5½	Gas.	¾
Oliver.....A	15-30	....	*2	Beav.	4-4½x6	GorK	3-4
Once Over Tiller Mark..6	12-25	3000	4	Strns	4-4½x6	Gas.	2
Parrett.....K	15-30	1950	4	Pitt	4-4½x6	G,K	3
Peoria.....L	12-25	1785	4	Clim.	4-5 x6½	G,K	3
Pioneer.....G	18-36	....	4	Own	4-5½x6	G,K,D	4
Pioneer.....C	30-60	....	4	Own	4-7 x8	Gas.	10
Planet Jr.	5-10	950	2	LeRoi	4-3½x4½	Gas	1
Plowman....A	15-30	1995	4	Buda	4-4½x6	G,K	3-4
Port Huron..A	12-25	$1700	4	Chief	4-4¾x6	G,K	3
Post.....D	12-20	1800	4	Wauk	4-4¼x5¾	GorK	2
Prairie Dog..L	9-18	650	3	Wauk	4-3⅜x5¼	Gas.	2
Prairie Dog..D	15-30	1250	4	Wauk	4-4½x6¼	Gas.	3
Ranger Cul. T-20	8-16	....	4	LeR.	4-3½x4½	Gas.	1
Reed	15-30	2250	4	Dom	4-4¾x6	K.	3-4
Reed.....A-1	18 36	2400	4	Dom	4-5 x6	Gas.	4
Reliable	10-20	985	4	Own	2-6 x7	Ker.	2
Rex	12 25	1600	4	Wauk	4-4¼x5¾	GorK	3
Russell	12-24	1500	4	Own	4-4½x5¾	GorK	2-3
Russell	15-30	2200	4	Own	4-5 x6½	GorK	3-4
Russell	20-35	3000	4	Own	4-5½x7	GorK	4-5
Russell	30-60	5000	4	Own	4-8 x10	GorK	8-10
Samson....M	.....	795	4	Nov.	4-4 x5½	G,K	2
Sandusky ...J	10-20	1250	4	Own	4-4¼x5¼	G,K,D	2
Sandusky ...E	15-35	1750	4	Own	4-5 x6½	G,K,D	4
Shawnee Com.	6-12	....	2	LeR.	4-3½x4½	Gas.	10
Shawnee Com.	9-18	....	2	Gray	4-3½x5	....	..
Shelby.....D	15-30	....	4	Beav.	4-4¾x6	G,K	3
Shelby.....C	10-20	....	4	Erd.	4-4 x6	GorK	2-3
Short Turn....	20-40	1500	3	Beav.	4-4¾x6	G,K	3
Square T....A	18-35	2075	3	Clim.	4-5 x6½	K,G	3
Steady Pull	12-24	1485	4	....	4-4 x5	Gas.	3
Stinson 4E	18-36	1835	4	Beav.	4-4¾x6	G,K	4
Stone	20-40	2250	4	Beav.	4-4¾x6	G,K	4
Tioga.....3	15-27	2625	4	Wisc.	4-4½x6	Gas.	3-4
Titan	10-20	900	4	Own	2-6½x8	G,K,D	3
Topp.....B	30-45	3500	4	Wauk	4-4¾x6¾	Gas.	3-4
Toro Cultivator	6-10	....	3	LeR.	4-3½x4½	Gas.	2
Townsend	10-20	1200	2	Own	4-6½x7	Ker	2-3
Townsend	15-30	1800	2	Own	4-7 x8	Ker	3-4
Townsend	25-50	3000	2	Own	4-8½x10	Ker	4-8
Traction Motor	40-50	....	4	....	8-3¼x5	Gas.	4-5
Traylor....TB	6-12	715	4	LeR.	4-3½x4½	Gas.	1-2
Triumph....H	18-36	2450	2	Erd.	4-4¾x6	Ker.	4
Trundaar....10	25-40	3750	*2	Wauk	4-5 x6¼	G or K	4
Turner...1921	14-25	1295	4	Buda	4-4¼x5½	G,K	3
Twin City	12-20	1580	4	Own	4-4¼x6	G,K	3
Twin City	20-35	3175	4	Own	4-5½x6¾	G,K	5
Twin City	40-65	5250	4	Own	4-7¾x9	G,K	8
Uncle Sam C20	12-20	1385	4	Weid.	4-4 x5½	G	2-3
Uncle Sam B19	20-30	2300	4	Beav.	4-4¾x6	G or K	3-4
Uncle Sam D21	20-30	1985	4	Beav.	4-4¾x6	G or K	3-4
Universal	1-4	475	2	Own	1-3½x5	G	1
Utilitor....501	2½-4	380	4	Own	1-3½x4½	G	5-6
Velie..Biltwell	12-24	1750	4	Own	4-4½x5½	G,K,D	3
Victory...1921	9-18	1350	4	Gray.	4-3½x5	Gas.	2
Victory...1921	15-30	1750	4	Wauk	4-4¼x5¾	Gas.	3
Vim.....B	15-30	1650	4	Wauk	4-4¾x5¾	G,K	3
Wallis.....K	15-25	1600	4	Own	4-4¼x5¾	G,K	3
Waterloo...N	12-25	....	4	Own	2-6½x7	G,K	3
Webfoot....53	28-53	5250	*2	Wisc.	4-5¾x7	G,D	6
Wellington..B	12-22	900	4	Erd.	4-4 x6	Ker.	2-3
Wellington..F	16-30	1400	4	Chief	4-4¾x6	Ker.	3-4
Western. 1920	16-32	2100	4	Clim.	4-5x6½	Gas.	4
Wetmore	12-25	1650	4	Wauk	4-4 x5¾	G,K	3
Wharton....E	12-20	1800	3	Buda	4-4¼x5½	Gas.	2
Whitney	9-18	1175	4	Own	2-5½x6½	Gas.	2
Wichita.....T	15-30	2500	4	Beav.	4-4½x6	G,K,D	3-4
Wisconsin...E	16-30	2250	4	Clim.	4-5 x6½	Ker.	4
Wisconsin...H	22-40	3200	4	Clim.	4-5½x7	Ker.	5
Yuba....15-25	15-25	2945	*2	Wisc.	4-4¼x6	G,K,D	..
Yuba....25-40	25-40	4892	*2	Wisc	4-5¾x7	G,K,D	..
Zelle	12-25	....	4	....	4-4½x5½	G or K	3

ABBREVIATIONS: G—Gasoline, K—Kerosene, D—Distillate. Plow capacity varies in relation to operating conditions. Figures are based on 14 in. plows. Engine Make; Beav.—Beaver, Clim.—Climax, Cont.—Continental, Dom.—Domas, Evin.—Evinrude, Herc.—Hercules, LeR.—LeRoi, Midw.—Midwest, Nway.—New Way, Nor.—Northway, Strns.—Stearns, T.C.—Twin City, Wauk.—Waukesha, Weid.—Weidely, Wis.—Wisconsin, *—Crawler type. All others are wheel type.

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Toronto, Canada	National Motor Show	Aug. 27
Toronto, Canada	Canadian National Exposition	Aug. 29—Opens
Milwaukee	State Fair Automobile Show	Aug. 29—Sept. 3
Byberry, Pa.	Phila. County Fair and Tractor Show	Sept. 5-10
Indianapolis	Automobile and Accessory Show	Sept. 6-10
Ottawa, Ont.	Automobile Show	Sept. 9 to 17
New York	Electrical Exposition	Sept. 28—Oct.8
Cincinnati	Fall Automobile Show	Oct. 1-8
Omaha	International Automobile Congress	Nov. 3-5
Olympia, England	Automobile Show	Nov. 3-12
Chicago	Automotive Equipment Show	Nov. 14-19
New York	Automobile Salon	Nov. 27-Dec. 3
Chicago	Automobile Salon	January, 1922
New York	National Automobile Show	Jan. 7-13, 1922
Chicago	National Automobile Show	Jan. 28—Feb. 3, 1922
Minneapolis	Tractor Show	Jan. 30 to Feb. 4, inclusive
Winnipeg, Canada	Canadian Automotive Equipment Ass'n Show	Feb. 6-11

RACES

Pikes Peak	Hill Climb	Sept. 5
Uniontown Speedway	Annual Autumn Classic	Sept. 5
Byberry, Pa.	Phila. County Fair	Sept. 10
Los Angeles	Speedway Race	Nov. 24

FOREIGN SHOWS

Buenos Aires, Argentina	Passenger Cars and Equipment	September
Luxemburg	Luxemburg Agricultural Sample Exhibition	September
Constantinople	Traction Trials	Sept. 5
Berlin	Automobile Show	Sept. 23—Oct. 2
Paris, France	Paris Motor Show	Oct. 5-16
London	British Motor Show, Society Motor Mfgs. and Traders	Nov. 4-11

CONVENTIONS

Detroit	Credit Convention Motor and Accessory Manufacturers' Ass'n	Sept. 14-16
Chicago	Twenty-eighth Annual Convention National Implement & Vehicle Association	Oct. 12-24
Cleveland	National Tire Dealers' Association	November
Chicago	Chicago Semi-Annual Convention of Factory Service Managers N. A. C. C.	Nov. 22-24
New York	Service Managers Convention	Nov. 22-24

Business Notes

All-American Truck Co., which has been in the hands of a receiver, will be placed on sale Aug. 30, when all assets of the company will be sold at a sheriff's sale. The inventory value is over $500,000.

Kearne Motors Corp. has taken over the agency for the Dixie Flyer for Chicago, northern Illinois and Indiana. The new firm is incorporated for $20,000 and will occupy a prominent position on Chicago's Automobile Row.

Post-Whitney Co., a consolidation of the Post Tractor Co., Cleveland, Whitney Tractor Co. Upper Sandusky, O., and the Chief Motor Co., Port Huron, Mich., has perfected production and distrubution plans. The officers of the company are: A. B. Whitney, president and treasurer; Harry S. Erd, vice-president and general manager; Ralph Blue, secretary, and C. E. Grove sales and advertising manager.

Madden-Atkinson Auto Co., Columbus, O., recently chartered, has been organized by the election of Ira P. Madden, president and Ralph P. Atkinson, vice president and general manager. The concern has contracted for the central Ohio distributing agency for the Columbus car.

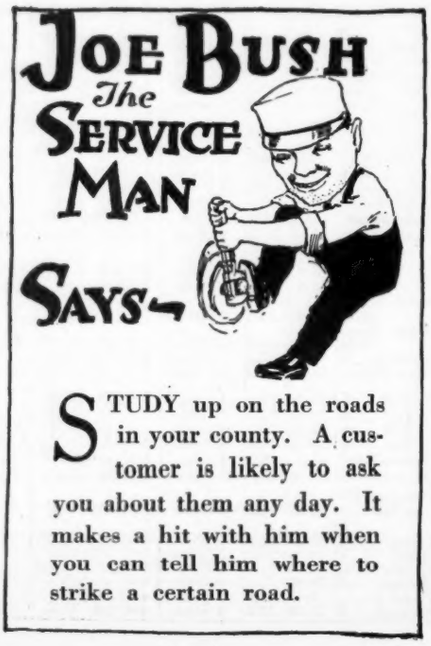
The Clark-Turner Piston Co., Los Angeles, manufacturers of DeLuxe piston, has been incorporated for $1,000,000. in order to take care of expanding business. The officers of the new company are: Edward W. Clark, president, Stanley S. Turner, vice-president and general manager, and Fred C. Galloway, secretary and treasurer.

Portage Tire & Rubber Co., which operates a plant in Barberton, has signed and filed in the United States District Court in Cleveland a petition in voluntary bankruptcy.

York cylinder boring machine, York, Pa., has been taken over by the York Equipment Co. with headquarters in Philadelphia.

Automotive Service Co., has just been formed at Terre Haute, Ind., and is operating in connection with the Walters Storage Battery Co.

Boyle rights under the reissue patent for canteens have been upheld in a decision in the United States District Court of Southern California. Two years ago W. J. Boyle Sr., of the Boyle Manufacturing Co., manufacturers of canteens for attachment to motor car running boards. brought suit against the Woolwine Metal Products Co., claiming infringment. In its ruling the court finds that the reissue patent is valid and that infringment has been made by the Woolwine company.



STUDY up on the roads in your county. A customer is likely to ask you about them any day. It makes a hit with him when you can tell him where to strike a certain road.

Chicago Garage Owners' Ass'n held a seasonal meeting Aug.18 at which Ray A. Sherman, merchandising director of the Automotive Accessories Assn. spoke on the general subject of retail merchandising, emphasizing ideal conditions as they may be applied to the garage and service station.

Automotive Equipment Assn., Chicago, through its new merchandising director, Ray W. Sherman, has made an appeal to the industry for a slogan fitting the greater sales campaign now being waged by the association. All ideas for such a sales phrase are to be sent directly to Mr. Sherman, City Hall Square Building, Chicago.

Goodyear Tire & Rubber Co. officials have started on a month's inspection tour of the company's subsidiary corporations. In the party are E. G. Wilmer, successor to F. A. Seiberling as president of Goodyear, vice-president and factory manager Paul Litchfield, and general sales manager L. C. Rockhill.

Hayes Wheel Co., Jackson, Mich., held a meeting of executives and distributors recently at which plans for a sales campaign were discussed with respect to the new demountable rim wheel which is to feature the company's business in the United States. Among those who spoke were W. D. Blood, head of W. D. Blood Co., New York, export agents for Hayes products; C. B. Hayes, president; G. S. Porter, Sargent Ziegenbien, C. F. Field and Mr. Brundage.

Sociability Rambles to Move Used Cars in South

New Orleans, Aug. 23—One of the plans adopted by the New Orleans Automobile Dealers' Assn. in an effort to solve the used car problem calls for a number of "sociability runs" from this city to nearby cities and towns.

W. P. Parkhouse states that he expects the first trip to be made Saturday, Aug. 20, to Baton Rouge, making Baton Rouge that night and returning to New Orleans Sunday. Baton Rouge is about 100 miles from New Orleans on the Mississippi river.

It is proposed that each dealer contribute one or more cars and invite prospective customers as well as those who have previously purchased cars.

The plan was outlined in a report of the committee of which J. D. Cathey is chairman, submitted at the monthly meeting of the dealers' association held at the clubhouse of the Louisiana Morot League at Chef Menteur.

The problem of placing value on used cars has become a real menace to the industry with falling prices, dealers declare, and the prices that once took care of repairing and repainting costs are no longer to be depended upon.

A. A. A. TO INCREASE ACTIVITIES

Washington, Aug. 15—The executive board of the American Automobile Assn. has decided to widen the scope of the association's activities. One of the subjects which will be taken up is that of automobile insurance. The question has been placed in the hands of a committee which has formulated plans for cheaper insurance for A. A. A. members. Retention of counsel familiar with automobile law to provide free legal advice to members will be given immediate consideration.

A new method of protecting members' cars from automobile thieves is being evolved and will be tried out in the near future in Washington.

The A. A. A. will renew at once its efforts to obtain the passage of a national reciprocity law which would mean that motorists could travel anywhere in the United States for unlimited periods with their home state license tag.